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Suicide and community traumatic events: is there a connection?

Regina T. Praetorius

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SUICIDE AND COMMUNITY TRAUMATIC EVENTS: IS THERE A
CONNECTION?

A Dissertation
Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Human Resource Education and Workforce Development

by
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May 2006

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DEDICATION

This dissertation is dedicated to one of the dearest people I have had the honor to know, my abuelito (grandfather), Wahib J. Habet. Abuelito, you have been one of the most influential people in my life, modeling love for family, neighbor, enemy and friend. Always charitable, you have shown me that being active in one's family and community is the only way to follow the great commandment of loving neighbor as self. Your sacrifices for family and dedication to us were sometimes misunderstood but always appreciated. You were here when I began this journey toward a PhD and I wish you were here to see it completed. One of my fondest memories is your beautiful smile when I graduated from the University of Texas at Austin with my Bachelor of Social Work. I hope to feel the warmth of your smile again at this graduation. I know you are on your journey home now but I miss you dearly. I look forward to the day when we will be together again in Heaven.

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ABSTRACT

The purpose of this study was to determine if a relationship exists between community traumatic events (CTEs) such as the September 11, 2001 terrorist attacks and the temporal distribution of suicide in a metropolitan Louisiana parish (county) in the Southern United States over the period of January 1, 1994 to December 31, 2004.

The researcher used data on suicides (homicides and accidental deaths were used for comparison) in the selected parish to describe the distribution of suicides over the 11 year period. A procedure was developed for identifying and categorizing CTEs sustained by the selected parish (county). A spectral analysis of the distributions was planned to identify patterns and assess whether these were related to the sustained CTEs. However, the spectral analysis was not completed due to violation of the necessary assumption of stationarity. As an alternate means of assessing relationships between CTEs and the distribution of suicides, Pearson's Correlation Coefficient was employed.

Two key conclusions are that no relationship was identified between the occurrences of CTEs and the distribution of suicide and, although the literature identifies patterns due to different aspects of seasonality (e.g. month of the year), the Werther Effect, and contagion or clustering of suicides, this study does not support these patterns.

In research dating back to Durkheim's landmark piece, *Le Suicide* [Suicide: A Study in Sociology] (1897/1951/1979), identified patterns have been studied and explained as functions of a variety of phenomena including inclement weather, cultural differences, social isolation, inactivity, and media coverage. However, in current

research and supported in this study, patterns are almost imperceptible. This may be explained by two plausible theories: (1) statistical tests previously employed were not appropriate for detecting patterns and (2) advances in communication and adapting to inclement weather has diminished the impact of these elements.

The primary implication of these findings is that suicide prevention programming should be ongoing and aimed at entire communities. A key recommendation is that this study be repeated on a national level, complementing the current research design with phenomenological psychological autopsies of a random sampling of those who died by suicide.

CHAPTER ONE

INTRODUCTION

Rationale

The impact of suicide, the act of intentionally ending one's own life, is felt the world over. The World Health Organization (WHO) (2004a) estimates that every 40 seconds, someone in the world dies by suicide and every 3 seconds, someone attempts suicide. Globally, about 1 million people died in the year 2000 by suicide. In 2001, it accounted for more deaths than homicide (500,000) and war combined (230,000) (WHO, 2004b). WHO reports that suicide is one of the top three leading causes of death worldwide for people ages 15 to 34 (WHO, 2004a). Although these estimates are astonishing, it is likely that these are low considering issues of underreporting and differences among these countries in reporting procedures (WHO, 2003).

WHO projects the number of people who die by suicide each year could reach 1.5 million by the year 2020 (2004b). Given the global magnitude of suicide, it is now considered a global public health problem by WHO (2001) and is also included in many countries' public health initiatives including those of Canada (Population and Public Health Branch, 2002), Australia (Health Services Division, 2000), and the United States (U.S. Public Health Service, 1999).

In the United States, suicide was the 11th leading cause of death for the overall population and the 3rd leading cause of death for young people for 2002. More people die by suicide than homicide in the U.S. (Homicides were ranked 14th in leading causes of death.) (McIntosh, 2004a), with suicides outnumbering homicides by a third (Goldsmith, Pellmar, Kleinman, & Bunney, 2002). One person dies by suicide

approximately every 16.6 minutes; and, although data compilation is not yet a national reality for suicide attempts, it is probable that 790,000 people attempted suicide in 2002 alone (McIntosh, 2004a). The U.S. Department of Health and Human Services (2001) estimates that approximately 650,000 people receive medical emergency treatment each year for injuries from suicide attempts. It is estimated that at least 5 million Americans have attempted suicide in their lifetime (McIntosh, 2004a). Clearly, suicide in the U.S. is a serious and widespread problem warranting further investigation.

When studying suicide in the U.S., a variety of clear and distinct patterns emerge. Two of the common demographic correlates for suicide are advanced age and being male. The highest rates of suicide are found among those 75 and older (Pearson, 2000) with an older person completing suicide every 94.7 minutes (McIntosh, 2004a).

Another equally important pattern is that in the U.S., men kill themselves more than women regardless of age and ethnicity (This trend is also observed globally except for China [Goldsmith et al., 2002]) with approximately four male suicides to every female suicide (McIntosh, 2004a). This is not the only gender discrepancy; in general, women, though dying by suicide at a much lower rate than men, attempt approximately three times more than men (McIntosh, 2004a).

A final stark fact about suicide in the U.S. is that it has the highest rate of youth suicide compared to 26 other westernized countries (Grossman & Kruesi, 2000). For young people, suicide is the third leading cause of death after accidents and homicides. Every 2 hours 11 minutes, there is one suicide of a person between ages 15 and 24. If one includes children under the age of fifteen in this group, there is a suicide every 2 hours 3 minutes of a person under the age of 24 (McIntosh, 2004a). Approximately six

adolescents (ages 10 to 19) kill themselves every day in the U.S. When one looks at the Years of Potential Life Lost (YPLL), beginning with an estimated average lifespan of 65, among people ages 15 to 24 the YPLL was approximately 200,000 in 1996. This breaks down to 17,000 YPLL for the five to fourteen year old group; and 106,808 YPLL for ten to nineteen year olds, with the remaining 76,192 YPLL being from the 20-24 year old age group (McIntosh, 2000a).

In 2002, the Institute of Medicine of the National Academies produced a report, *Reducing Suicide: A National Imperative*. This report covers the economic cost of suicide extensively and cites four areas of impact:

- (1) Medical expenses of emergency intervention and non-emergency treatment for suicidality. These medical costs are not borne by the health care industry alone, but by all of society through higher health care costs that are ultimately passed on to workers and taxpayers.
- (2) The lost and/or reduced productivity of people suffering from suicidality.
- (3) The lost productivity of the loved ones' grieving a suicide [survivors of suicide].
- (4) Lost wages of those completing suicide, with the greatest absolute numbers of suicides occurring before retirement (Goldsmith et al., 2002, p. 56).

Calculating just the lost wages of those who suicided in 1998, the U.S. absorbed a loss of approximately \$11.8 billion (Goldsmith et al.). This estimate does not begin to cover costs for autopsies of deaths by suicide, cost of medical and mental health treatment of people who attempt suicide and costs of therapy for survivors of suicide (e.g. grief counseling, antidepressants). In a 1995 study, direct and indirect costs were estimated for both suicide attempts and deaths by suicide for 1994. Direct costs (whether to the family or the public) were defined to include hospitalization and fees for doctor visits, autopsies, and coroner investigations; indirect cost was YPLL in terms of lost wages.

Estimates were that the direct cost for suicide attempts and suicide deaths respectively were \$581 million and \$17.9 million and indirect costs were \$15.82 billion for suicide attempts and deaths by suicide combined (Palmer, Revicki, Halpern, & Hatzianandreu, 1995).

In addition to the economic impact of suicide, the social impact is of immediate and graver concern because there is evidence that certain types of exposure, specifically being a survivor of suicide (Cain, 1972) and exposure to media coverage of suicide may increase the likelihood of a person dying by suicide (Phillips & Lesyna, 1995). Each suicide in the United States leaves between six (Shneidman, 1969) and 24 survivors with varying relationships to the deceased (Campbell, 2001b) to grieve the loss of a loved one to this tragic cause of death. It is estimated that once a person becomes a suicide survivor, his or her risk of dying by suicide increases nine times (Cain, 1972).

Additionally, there is evidence that media coverage of suicides results in increases in the rate of suicide in the geographical area receiving the media exposure. Non-fictional coverage (e.g. newspapers, TV news) seems to have more impact than fictional coverage (e.g. made-for-TV movies) with the most impact seen among adolescents. This phenomenon is referred to as the Werther Effect (Phillips & Lesyna, 1995). An effect similar to the Werther Effect is the Cobain Effect. This effect was identified after the suicide of rock star Kurt Cobain in 1994. Due to the Werther Effect, there was much concern voiced by the general public that Cobain's suicide would cause a suicide contagion in the youth population of the Seattle area where he killed himself. Cobain's suicide was followed by media attention referring people to the local crisis

center and a candlelight vigil where his wife expressed her grief over his death. What was observed after the death was not a rise in the suicide rate as is observed with the Werther Effect but rather an increase in suicide-related phone calls to the local crisis center hotline (Jobes, Berman, O'Carroll, Eastgard, & Knickmeyer, 1996).

Being a survivor of suicide and being exposed to media coverage of suicides are not the only risk factors that may contribute to a person's likelihood of dying by suicide. Situational factors are also important to consider. Some of the most common factors found among people who kill themselves are depression, anxiety, and post-traumatic stress disorder (PTSD). These often have a situational component, usually in the form of a precipitating event that serves as a trigger (Anxiety Disorders Association of America, 2005; Kessler, 2000; Seligman, 1998).

A precipitating event may be direct (experienced or observed) or secondary (e.g. being close to someone who experienced or observed the event; experiencing the event through media coverage) (Seligman, 1998). Some examples of extreme stressors include sexual assault, physical assault, combat, automobile accidents, life-threatening illnesses, and natural and human-made disasters (American Psychiatric Association [APA], 2000).

Natural and human-made disasters, which will be termed community traumatic events (CTE), are of particular interest to the prevention of suicide given recent events such as the September 11, 2001 terrorist attacks and the devastation of Hurricanes Katrina and Rita in 2005. Community traumatic events encompass a wide range of events. Examples of naturally occurring CTEs include tornadoes, hurricanes and blizzards; whereas recent human-made CTE examples include the Oklahoma City

Bombing, Columbine School Shootings, the September 11, 2001 terrorist attacks, and the London Bombings of 2005. To qualify as a community traumatic event, the survivors of the crisis, regardless of whether it occurred in the community of interest, experience changes in their daily lives due to the occurrence. These changes may include an emotional response including depression and/or anxiety which is complicated by other changes including economic stress and limitations to daily activities (e.g. curfews, increased traffic, and shortages of resources).

In the time period after these community traumatic events, there are many factors that may continue to re-traumatize the survivors (James & Gilliland, 2001) ultimately leading to what 30 years of suicide research has deemed the most common underlying factor of suicide: hopelessness (e.g. Goldsmith et al., 2002; Weishaar, 2000). In researching this hopelessness or intense psychological pain for over 50 years, Shneidman (1996) has come to term this as *psychache* and posits that if a person's psychache can be reduced, then death by suicide can often be prevented. One strategy in suicide prevention worth exploring is reducing the psychache associated with community traumatic events.

Purpose Statement

The primary purpose of this study was to determine if a relationship exists between community traumatic events such as the September 11, 2001 terrorist attacks and the temporal distribution of suicide in a metropolitan Louisiana parish (county) in the Southern United States over the time period of January 1, 1994 to December 31, 2004. In 2002, Louisiana ranked 31st in the nation (out of 50 states and the District of Columbia) for deaths by suicide. The state of Louisiana's rate of suicide was 11.1 per

100,000, which is comparable to the national rate (11 per 100,000) (McIntosh, 2004b) making it particularly suitable for this type of study.

Objectives of the Study

Specific objectives formulated to guide the research included to:

1. Describe individuals who died by suicide in a metropolitan Louisiana parish (county) from January 1, 1994 to December 31, 2004 on the selected characteristics of:
 - a. Age
 - b. Gender
 - c. Race
 - d. Method of death
 - e. Date of birth
 - f. Date of death

For comparison groups, people who died by homicide and accident during the time period were described on the same characteristics. Additionally, calls to the area's American Association of Suicidology certified crisis intervention center's 24-hour crisis hotline between January 1, 1994 and December 31, 2004 were described on the selected characteristics of age of caller, gender of caller, race of caller, type of call, and date of call.

2. Describe and compare the temporal distribution of suicides in a metropolitan Louisiana parish (county) from January 1, 1994 to December 31, 2004 with the temporal distributions of homicides and accidental deaths during the same period, exploring for trends on the variables day of the week of death, week of

the month of death, and month of the year of death. Additionally, describe the distribution of calls to the local crisis center hotline on the variables of day of the week, week of the month, and month of the year.

3. Describe the community traumatic events and publicized suicides experienced by a metropolitan Louisiana parish (county) community during the period of January 1, 1993 to December 31, 2004 on the level of impact defined as local, regional, national, or international. In addition, each of these crises was then categorized as natural, human-made, or suicide.
4. Determine the length of the effect of a community traumatic event on a community after the initial announcement of the event as measured by changes in the temporal distribution of suicide and changes in the volume of suicide-related calls to the local crisis hotline.
5. Determine if a model exists explaining a significant portion of the variance in the per capita suicide rate following community traumatic events from selected societal and personal demographic characteristics.

Significance of the Study

Shneidman (1985) emphasizes that there is no one attribute, condition, or event that is solely responsible for a person's death by suicide. Suicide's cause is multidimensional and it is necessary to study different contributing factors in this "multidimensional malaise" (Shneidman, 1985). The impact of community traumatic events as one contributing piece to the puzzle of why people die by suicide is the focus of this study.

The significance of the study is that in determining if relationships exist between community traumatic events and the temporal distribution of suicide, the mental health community (e.g. social workers, psychologists, counselors, psychiatrists), the community of first-responders (e.g. fire-fighters, law enforcement, emergency medical service providers), healthcare providers, and government officials will be better informed of the impact of these events and will be able to apply the information in the development of plans for alleviating the stress of these events. Additionally, this information can be used in providing support for postvention efforts after all community traumatic events. Shneidman (1973), who originated the term “postvention” with relation to the aftermath of a suicide, defined suicide postvention as “appropriate and helpful acts that come after a dire event” with the purpose of “alleviation of the effects of stress in the survivor-victims of suicidal deaths, whose lives are forever changed” (p. 33). Leenaars (1998) extended this to “‘those things done’ to address and alleviate possible aftereffects of trauma (e.g., suicide, homicide, terrorist attacks)” (p. 357).

Definitions

- Community Traumatic Event: an event that adversely affects an entire community or its vast majority in a detrimental way; these effects may be of an economical, physical, mental, or emotional nature and events might be either human-made or naturally occurring.
- Human-Made Community Traumatic Event: these include human made events (e.g. terrorist attacks, serial killings) that cause increased stress for the residents in the area affected.

- Natural-Made Community Traumatic Event: these include any naturally occurring event (e.g. tornadoes, hurricanes, floods) that may cause increased stress for the residents of the area affected.
- Postvention: “‘those things done’ to address and alleviate possible aftereffects of trauma (e.g., suicide, homicide, terrorist attacks)” (Leenaars & Wenckstern, 1998, p. 357).
- Psychological Autopsy: “*procedure for reconstructing an individual’s psychological life after the fact*, particularly the person’s lifestyle and those thoughts, feelings, and behaviors manifested during the weeks preceding death in order to achieve a better understanding of psychological circumstances contributing to a death” (Clark & Horton-Deutsch, 1992, p. 144).
- Suicidal Ideation: “Any self-reported thoughts of engaging in suicide-related behavior” (O’Carroll et al., 1996, p. 247).
- Suicidality: suicidal ideation and/or suicide-related behaviors.
- Suicide: “suicide is a conscious act of self-induced annihilation, best understood as a multidimensional malaise in a needful individual who defines an issue for which suicide is perceived as the best solution” (Shneidman, 1985, p. 203).
- Suicide Attempt: “A potentially self-injurious behavior with a nonfatal outcome, for which there is evidence (either explicit or implicit) that the person intended at some (nonzero) level to kill himself/herself. A suicide attempt may or may not result in injuries” (O’Carroll et al., 1996, p. 247).

- Suicide Postvention: “appropriate and helpful acts that come after a dire event” with the purpose of “alleviation of the effects of stress in the survivor-victims of suicidal deaths, whose lives are forever changed” (Shneidman, 1973, p. 33).
- Suicide-Related Behaviors: “Potentially self-injurious behavior for which there is explicit or implicit evidence *either* that (a) the person intended at some (nonzero) level to kill himself/herself, *or* (b) the person wished to use the appearance of intending to kill himself/herself in order to attain some other end. Suicide-related behavior comprises suicidal acts and instrumental suicide-related behavior” (O’Carroll et al., 1996, p. 247).
- Survivors of Suicide: “Those who are significantly impacted by the death of someone to suicide. This term is not limited to next of kin, and can include strangers who witness the suicide or discover the body, including first responders” (Campbell, 2001b, p. 20).

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

Introduction

Understanding suicide, like understanding any complicated human act, is a complex endeavor, involving knowledge and insight drawn from many points of view...there are biological, psychological, intrapsychic, logical, conscious and unconscious, interpersonal, sociological, cultural, and philosophical/existential elements in the suicidal event (Leenaars, 1996, p. 221).

The field of suicidology has a long and complicated history riddled with struggles and obstacles. The task of studying suicide is a daunting one for two main reasons: 1) as noted above, there are a multitude of elements that interact to result in a person's death by suicide and 2) while suicide is a phenomenon that is experienced the world over, it occurs at such a low rate that large population studies are needed for effective research. Numerous studies in countless fields, including social work, psychology, thanatology, suicidology, psychiatry, medicine, public health, epidemiology, sociology and economics, have attempted to shed light on why people kill themselves and on how to prevent future deaths (Goldsmith, Pellmar, Kleinman, & Bunney, 2002). Leenaars (1996) and other suicidologists posit that in studying suicide, it is important to realize and respect that suicide cannot be reduced to one cause such as a traumatic event or other source of stress or pain. Instead, suicide needs to be understood as the interaction of numerous aspects of a person's experience. Shneidman (1985) uses the metaphor of a tree for understanding suicide. He states,

An individual's biochemical states, for instance, are the roots. An individual's method of suicide, the contents of the suicide note, the calculated effects on the survivors and so on, are the branching limbs, the flawed fruit, and the camouflaging leaves. But the psychological component, the problem solving choice, the best solution of the perceived problem, is the main "trunk" (p. 202-203).

While a variety of theories have been developed based on the branches, fruit, and leaves, for this literature review, the focus will be on the trunk of the tree, the psychological component, which has as one of its subparts, stressful events including community traumatic events (e.g. hurricanes, terrorist attacks). In focusing on this trunk, it is important to clearly define the tree. Maris, Berman and Silverman (2000), in their *Comprehensive Textbook of Suicidology*, make painstaking efforts to define suicidality. They emphasize that it is complicated to define fully not only because of its multidimensional nature but also because it seems to be more of a continuum than a finitely defined, dichotomous variable with the levels of “died by suicide” and “did not die by suicide”. In their attempts to clear up the murky waters, they define the distinction between death by suicide and other self-destructive behaviors (e.g. suicide attempts, deliberate self-harm), pointing to suicide deaths as the logical starting point for suicidology research. They turn to Maris’ 1981 work which identifies death by suicide and attempted suicide as separate phenomena sharing only a small portion of overlap due to the estimated small percentage (10-15%) of suicide attempters who ultimately die by suicide. Returning to Shneidman’s (1985) tree metaphor, it is appropriate to emphasize that the trunk is what people who attempt suicide and people who die by suicide have in common but the outcomes leave two distinct diversions (see Figure 1 for a visual representation).

For understanding the tree trunk of the suicide metaphorical tree and the major branch of components resulting in death by suicide, the theory of suicide as escape (Baumeister, 1990) is the framework for this study and will be explained in depth throughout this literature review. The purpose of this review of related literature is to

organize selected existing knowledge of death by suicide using the suicide as escape framework for understanding the hypothesized relationship between community traumatic events and the temporal distribution of suicide. When appropriate, shared aspects of attempted suicide and death by suicide research will be included. Areas to be discussed include: 1) prevalence, temporal trends, and demographic trends of suicide; 2) economic and social impact of suicide; 3) selected risk factors; 4) selected protective factors; 5) impact of community traumatic events; and 6) research design.

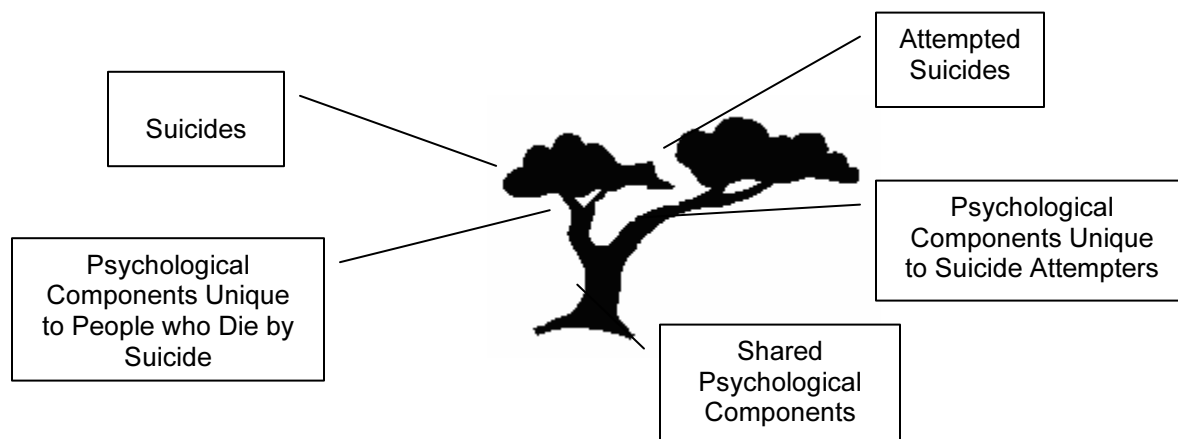


Figure 1. Extension of Shneidman's Metaphor of Suicide as a Tree.

Theoretical Framework: Suicide as Escape

I believe there's no suicide without a great deal of suffering. That's in combination with the notion of death as escape. It's in combination with the thought "I won't take this," "I don't have to take this," and suicide is an ending, it's a stopping, it's a stopping of the unbearable flow of consciousness (From a published interview with Edwin Shneidman [Carvalho & Branfman, 2003, p. 11]).

The idea of suicide as escape was first developed into a theory by Baechler in 1980 and was based on findings of several studies of suicide. Three studies Baechler (1975/1979, 1980) conducted to organize types of suicide into taxonomies showed that the escape category was the most common. In 1985, Smith and Bloom found that more than 50% of the suicides in their sample fit Baechler's escape category.

Baechler's (1980) initial theory has since been revised by Baumeister (1990) who's "central argument is that suicide is often an escape from the self" (p. 90).

Baumeister's revision has six steps that a person theoretically traverses on the way to suicide as an escape. These are: (1) a "severe experience"; (2) self-blame and/or self-deprecation; (3) "state of high self-awareness"; (4) negative affect develops or there is an absence of affect; (5) "the person responds to this unhappy state by trying to escape from meaningful thought into a relatively numb state of cognitive deconstruction"; and (6) inhibitions decrease (p. 91). To expand upon the stages, the first stage is when the stressful change or event occurs. Baumeister proposes that the event (or absence of an anticipated event) is stressful to the person because it does not meet their anticipation or expectation. In the midst of this disappointment, in stage two, the person remembers or focuses on real or perceived shortcomings and thus revisits or amplifies self-depreciative thoughts and, often, assumes responsibility for the event or its absence (whether it is rational or not). The third stage involves the emergence of concrete, dichotomous thinking (e.g. seeing things as only right or wrong, true or false, acceptable or unacceptable or what Shneidman [1996] termed tunnel vision or constricted thinking) and an absence of ability to see multiple sides of a story or explanation (e.g. "Everything else is my fault and this is too"). In stage four, the person begins manifesting negative affect; negative affect according to Baumeister encompasses depression, anxiety and anger. Stage five is where the first attempts at escape emerge by self-imposing numbness to things that might be anxiety-producing. Baumeister proposes that this stage may be sufficient to get the person through the period until a positive life event occurs to provide new balance, positive fuel for reinterpreting the self and life events,

and hope. However, if that does not happen, Baumeister posits that the ultimate escape then is suicide which has the “main appeal...that it offers oblivion” (p. 93).

Of course, Baumeister’s (1990) theory does not operate in a vacuum and he is quick to emphasize that this theory is not applicable to all suicides. He proposes certain conditions that might be present when the theory applies. Baumeister emphasizes that one thing suicide research communicates undoubtedly is that suicide is more common when things are going well. Support for this contention is evident in existing research which demonstrates that suicide is more prevalent: (a) in prosperous areas (Argyle, 1987; Lester, 1985, 1987); (b) in societies where freedom and individualism are promoted (Farberow, 1975a); (c) in areas with mild weather (Lester, 1986); and (d) during the spring and summer months (Campbell & Lester, 1996; Durkheim, 1897/1951/1979; Lester, 1979; Morselli, 1881; Nayha, 1982; Parker & Walter, 1982; Stack, 1995). Baumeister proposes this is because, when conditions are optimal, high expectations develop and leave a person prone to despair if a negative event intercedes (or if an expected, positive event does not occur). Support for this in the literature includes that suicide rates increase (a) when there are changes for the worse in the economy (Araki & Murata, 1987; Argyle, 1987; Holinger, 1978; Wasserman, 1984); (b) after weekends (Lester, 1979; Massing & Angermeier, 1985; Rothberg & Jones, 1987; Stack, 1995); (c) after holidays (Phillips & Liu, 1980; Phillips & Wills, 1987) (d) when one is recently bereaved (Bunch, 1972; MacMahon & Pugh, 1965) and (e) when one moves from a married state to a single state or experiences other breakdowns of significant relationships (Berlin, 1987; Bourque, Kraus, & Cosand, 1983; Conroy & Smith, 1983; Hendin, 1995; Loo, 1986; Maris, 1981; Stephens, 1985; Tishler, McKenry, & Morgan,

1981). Research supports that typically, negative life events occur temporally close to death by suicide (e.g. Heikkinen & Lönqvist, 1996; Maltzberger, Hendin, Haas, & Lipschitz, 2003; Pfeffer, 1996); it is also noted in the literature that there are typically a series of negative life events that lead to the heightened self-awareness in stage three manifested as dichotomous thinking (Cochrane & Robertson, 1975; Felitti et al., 1998; Paykel, Prusoff, & Meyers, 1975; Power, Cooke, & Brooks, 1985; Schotte & Clum, 1982). This may be especially true among adolescents as shown by Pfeffer (1996) whose research indicates that the prevalence of personal crises is higher among suicidal youth than non-suicidal youth. A few of these negative life events, or personal crises, include unemployment, relational conflicts (especially among adolescents [Huff, 1999]), family discord (e.g. divorce, separation, abuse) (especially with regard to suicidality among women [Fazza & Page, 2003; Stephens, 1988]), loss of a loved one (whether due to suicide or other cause of death), compromised physical health (e.g. cancer, AIDS), and sexual (Ullman & Brecklin, 2002) and physical assault victimization (Simon, Anderson, Thompson, Crosby, & Sacks, 2002).

Unemployment has been found to be more prevalent among people who die by suicide than control groups (Yang, 1988). Unemployment was also identified by Brown, Beck, Steer, and Grisham (2000) as a significant risk factor ($HR = 2.56$, $p = .004$) in a 20-year prospective study of psychiatric outpatients who ultimately died by suicide. Finally, in a study of the stability of hopelessness over time (a factor found to be common to a majority of suicides [Goldsmith, et al., 2002; Weishaar, 2000]), unemployment was found to be significantly associated with ongoing hopelessness in men (Haatainen et al., 2003).

Family discord encompasses many situations; often, the most traumatic type of family discord is rooted in the tragedy of child sexual abuse and other childhood traumas. Childhood traumas, in addition to sexual and physical abuse include emotional abuse, neglect, witnessing violence (whether domestic or other), separation from parents (e.g. death, imprisonment, separation, divorce), and living with family members with addictions, severe mental illness, and/or suicidality. It is estimated that 52% of children experience at least one of these forms of trauma during childhood (Fellitti et al., 1998). Stephens (1988), in a study of life histories of 50 females who had attempted suicide found that relationships with parents/caregivers during childhood fell into at least one of the following categories: abusive, emotionally impoverished, parent with addiction (specifically alcohol), parent with mental illness, or parent absent (causes of separation not noted). Child abuse specifically is a strong risk factor for suicidality among all age groups with 9% to 20% of adult suicide attempts being linked to childhood sexual abuse (Goldsmith et al., 2002). Anderson, Tiro, Price, Bender and Kaslow (2002) found that previous abuse was positively correlated with suicide attempts, whether it was emotional ($r = .34$, $p < .0001$), physical ($r = .25$, $p < .0001$), or sexual ($r = .22$, $p < .0001$).

Research by Fellitti et al. (1998) supports that there are typically a series of negative events or personal crises during childhood that have a lasting and negative impact. Particularly, children who experience childhood trauma are estimated to be up to 25 times more likely to attempt suicide (Santa Mina & Gallop, 1998). Focusing on childhood sexual abuse, Paolucci, Genuis, and Violato (2001), in a meta-analysis of 37 studies totaling over 25,000 subjects, found a sizeable link between childhood sexual

abuse and suicidality with a weighted effect size of 0.44. Additionally, Gibb et al. (2001) concur with Anderson et al. (2002) that emotional abuse is the most likely of the three types of child abuse to result in suicidal ideation.

Another type of negative life event that might contribute to need for escape is family separation. Family separation takes on a variety of forms and represents a crisis for a child regardless of reason for separation. In a review of the related literature, Lloyd (1980) notes that childhood bereavement of a loss of a parent (whether to death or other type of separation) is associated with depression in the adult years, often a risk factor for death by suicide. Bron, Strack, and Rudolph (1991) found that suicide attempts were higher among people who had lost a parent (regardless of type of loss) during childhood. Divorce is another type of family discord/relational conflict that not only contributes to the risk for suicidality among the children in the family unit but also among the spouses. Lester (1988a) found that the suicide rate among men was substantially and positively correlated with the divorce rate ($r = 0.69$, $p < 0.05$) and there was a very strong positive association between the divorce rate and the rate of suicide among women ($r = 0.80$, $p < 0.05$).

Compromised physical health can also be a type of personal crisis that results in a desire to escape through suicide. In a study of the impact of declining health on the elderly using Baumeister's (1990) escape theory as a framework, Reich, Newsom, and Zautra (1996) found that a decline in health had a low positive association with suicidal ideation ($r = 0.27$, $p < 0.001$). Further, the correlation between suicidal ideation and the constricted thinking described in stage three of Baumeister's theory was positive and substantial ($r = 0.52$, $p < 0.001$) and between suicidal ideation and hopelessness was

also positive and substantial ($r = 0.52$, $p < 0.001$). In a review of existing studies, Hughes and Kleespies (2001) concluded that the nature of the ailment mediates the risk of dying by suicide with patients diagnosed with multiple sclerosis, brain cancers and HIV/AIDS having the most elevated level of risk.

One might ask: what is it that leads people to consider suicide as the best and only escape from their respective difficulties in life? This question may seem especially salient when considering that a majority at some point or another will experience at least one of the personal crises provided as support for the escape theory of suicide. Research into why people kill themselves has covered many possible answers to this question. In over 30 years of suicide research, the most common underlying factor that has been identified in the majority of suicides is hopelessness (e.g. Beck, Kovacs, & Weissman, 1975; Goldsmith et al., 2002; Kazdin, French, Unis, Esveltdt-Dawson, & Sherick, 1983; Minkoff, Bergman, Beck, A. & Beck, R., 1973; Petrie & Chamberlain, 1983; Weishaar, 2000). This relates closely to Baumeister's (1990) theory of escape as demonstrated by Dean and Range (1999) who found using structural equation modeling that it was not necessarily the event that led to suicidality but rather the intensity of the accompanying hopelessness.

Hopelessness: Risk Factor or Key Factor in the Escape Theory Framework?

I tried years earlier to kill myself, and nearly died in the attempt...It was simply the end of what I could bear, the last afternoon having to imagine waking up the next morning only to start all over again with a thick mind and black imaginings. It was the final outcome of a bad disease [manic depression], a disease it seemed to me I would never get the better of. No amount of love from or for other people—and there was a lot—could help. No advantage of a caring family and fabulous job was enough to overcome the pain and hopelessness I felt; no passionate or romantic love, however strong, could make a difference. Nothing alive and warm could make its way through my carapace. I knew my life to be a shambles, and I believed—incontestably—that my family, friends, and patients

would be better off without me. There wasn't much of me left anymore, anyway, and I thought my death would free up the wasted energies and well-meant efforts that were being wasted on my behalf (Jamison, 1999, p. 290-291).

The above quote from Kay Redfield Jamison's book, *Night Falls Fast*, gives insight into her own hopelessness when she attempted suicide. One of the first theories of hopelessness was set forth by Abramson, Seligman, and Teasdale in 1978.

Abramson has since joined with Metalsky and Alloy (1989) to revise this theory and rename it: hopelessness depression. They propose that hopelessness is a subtype of depression with somewhat unique characteristics, which are organized into categories of symptoms, cause, and course. Symptoms of hopelessness depression include intense sadness, sleep disturbances, compromised ability to concentrate, suicidality, and an attitude of helplessness (Abramson, Metalsky, et al., 1989).

Cause is of particular interest for this literature review and Abramson, Metalsky, et al. (1989) propose that one of the causes of hopelessness *is* hopelessness. In their words:

A proximal sufficient cause of the symptoms of hopelessness depression is an expectation that highly desired outcomes will not occur or that highly aversive outcomes will occur coupled with an expectation that no response in one's repertoire will change the likelihood of occurrence of the outcomes (p. 359).

It is suggested that there is a chain of events leading to this hopelessness, a series of events (whether negative events or the absence of positive events) that continue to breakdown the individual's ability to be hopeful about the future. This resembles Baumeister's (1990) contention that stressful life events, in a given context, can be the impetus for a downward spiral into despair resulting in the person's thinking that suicide is the only escape. In other words, hopelessness depression, as theorized by

Abramson, Metalsky, et al., can be viewed as an integral component of Baumeister's escape theory of suicide.

Just as Baumeister (1990) emphasizes that a person could stop at stage five of this theory of suicide as escape and never arrive at suicide as the only possible solution, it is important here to point out that hopelessness does not always lead to suicide. Abramson, Metalsky, et al. (1989) propose that this inconsistency has to do with the interpretation of the events, specifically the "why" and the perceived (whether rational or not) consequences. The interpretation of events and consequences is the moderating variable as to whether or not a person develops hopelessness depression. Related to the contributing nature of negative life events to hopelessness depression is the conclusion of Alloy, Kelly, Mineka, & Clements (1990) that many people who have depression also suffer from anxiety, perhaps due to the fear that more negative events will follow.

Aaron T. Beck is one of the leading researchers in depression, anxiety, and hopelessness and has conducted numerous studies to investigate the relationships between these and suicide. The Beck Depression Inventory[®] (BDI), Beck Anxiety Inventory[®] (BAI) and the Beck Hopelessness Scale[®] (BHS) are widely used in clinical assessment of people exhibiting suicidality. Through his research using these different instruments, Beck concludes that hopelessness is the most significant predictor of suicide. For example, Kovacs, Beck, and Weisman (1975) found that hopelessness, as measured by the BHS, has a substantial positive correlation with suicidal intent ($r = 0.68$).

Introduction to the Problem: Prevalence and Trends of Suicide

Almost no country in the world is innocent to the tragedy of suicide (though some tribes and subcultures are) (Maris, Berman, & Silverman, 2000); its prevalence is international and profound. The World Health Organization ([WHO], 2003) estimates that every 40 seconds, someone in the world suicides and every 3 seconds, someone attempts suicide. It is estimated that in 2000, about 1 million people killed themselves (WHO, 2003) and that by 2020 this estimate could reach 1.5 million (WHO, 2004b).

Phenomena in suicide observed worldwide include that suicide is one of the three leading causes of death for people ages 15 to 34. Also, internationally it is observed that men kill themselves more than women in all countries except China (Goldsmith et al., 2002). Here it is important to note that these estimates may be lower than actual occurrences given underreporting and differences in reporting methods among countries (WHO, 2003). Despite this inconsistency in reporting methods, suicide is so ubiquitous that it has been classified as a global public health problem (WHO, 2001) and many nations are beginning to classify suicide as an essential area of concern in public health initiatives. Canada (Population and Public Health Branch, 2002), Australia (Health Services Division, 2000), and the United States (U.S. Public Health Service, 1999) are three nations that have taken this step.

Prevalence of Suicide in the United States

In 2002, suicide was the 11th leading cause of death for the overall population and the 3rd leading cause of death for young people (McIntosh, 2004b). Despite popular conceptions, suicides outnumber homicides by a third (Goldsmith et al., 2002) in the U.S. with homicides ranking 14th in leading causes of death for 2001. National

data for suicides in 2002 indicate that a person dies by suicide approximately every 16.6 minutes with men dying by suicide four times more often than women. Additionally, it is estimated that in 2002 there were 790,000 suicide attempts, at a ratio of three attempts by females to every attempt made by a male (McIntosh, 2004b). Approximately 650,000 people receive medical emergency treatment each year for injuries from suicide attempts (U.S. Public Health Service, 2001) and it is estimated that at least 5 million Americans have attempted suicide at some point in their lifetime (McIntosh, 2004a). Suicide statistics for 2002 (the most recent year available) are illustrated in Table 1 along with statistics for 1996 through 2001 (statistics for years prior to 1996 were not readily available); all are compiled from official data analyzed by McIntosh (1998b, 1999b, 2000c, 2001b, 2002b, 2003b, 2004b) for the American Association of Suicidology (AAS). Worth emphasizing here is that underreporting is still an issue for the U.S. as well with regard to deaths by suicide (Goldsmith et al., 2002).

Table 1
Summary Suicide Statistics for the United States, 1996 through 2002

	1996	1997	1998	1999	2000	2001	2002
Rate ^a	11.6	11.4	11.3	10.7	10.7	10.8	11
CDR ^b	9 th	8 th	8 th	11 th	11 th	11 th	11 th
Homicide CDR ^b		13 th	13 th	14 th	14 th	13 th	14 th
Youth CDR ^b	3 rd	3 rd	3 rd	3 rd	3 rd	3 rd	3 rd
Elderly CDR ^b	14 th	14 th	15 th	-	-	-	-
1 Suicide every... ^c	17.1	17.2	17.2	18	18	17.2	16.6

(Table continued)

1 Youth Suicide every... ^c	121	125.6	127.1	134.7	132	132.4	131
1 Elderly Suicide every... ^c	90	91.8	90.1	95.8	99.3	97.5	94.7

Note. The dashes indicate data that were not reported.

^a Per 100,000.

^b Cause of death ranking.

^c Unit is Minutes.

Methods Used for Death by Suicide in the United States

In the U.S. in 2002, 54% of the suicides involved a firearm; other methods included hanging (20.4%) (McIntosh, 2004b), which is the most commonly used method globally (Maris, Berman & Silverman, 2000); poisoning (17.3%); falls (2.3%); cutting/piercing (1.8%); drowning (1.2%); and self-immolation (0.5%) (McIntosh, 2004b). In general, among youth (10 to 19 years of age), firearms (49%) are the most prevalent choice followed by hanging (38%) and poisoning (7%) (U.S. Centers for Disease Control and Prevention, [CDC] 2004a). Examining data from 1996 to 2002, firearms have accounted for more than half of the suicides each year (1998b, 1999b, 2000c, 2001b, 2002b) and have recently become the most commonly used method among both men and women (previously, males used firearms more than any other method and females died by drug overdose more than any other method) (Maris, Berman, & Silverman, 2000).

Choice of method is influenced by a variety of factors. One, logically, is availability; closely related to this is useability (e.g. experience with method and level of comfort using method). Many studies have found that having a firearm available in the house increases the likelihood of suicide. For example, Birckmayer and Hemenway (2001) found that firearm ownership was substantially positively correlated with death by suicide ($r = 0.60$, $p < 0.05$). They subsequently adjusted for divorce, unemployment,

education, and characteristics of the community (i.e. urban to rural continuum) and this correlation was still found to be significant. After focusing on these correlations by age, they found that this correlation remained for youth ages 15 to 24 and for the elderly ages 65 to 84 but not for those 25 to 64 years of age.

Also important in method choice is the message; certain methods may have more significance to the person's plight, relationships, and desired reaction from survivors (Hendin, 1995; Maris, Berman, & Silverman, 2000). An example is the method chosen by the main character in the movie *Leaving Las Vegas*. In this movie, Ben Sanderson, an alcoholic, after experiencing the breakup of his family and the loss of his job undoubtedly both due to his alcoholism, decides to drink himself to death (Figgis, 1995). Other messages that may be communicated through choice of method include whether this is part of an imitation or contagion (Maris, Berman & Silverman, 2000). After Kurt Cobain's suicide in 1994, a young man in the Seattle area where Cobain suicided took his life in the exact manner Cobain did. Based on the paraphernalia in his home, the victim was clearly a fan; later it was discovered that he also had a history of depression, isolation, and familial suicide (Jobes, Berman, O'Carroll, Eastgard, & Knickmeyer, 1996).

With regard to chosen method and gender differences, Lester (1988a) proposes that one explanation may be that males choose active methods (e.g. firearms, hanging) while women choose passive methods (e.g. poisoning). He proposes that this, in part, also relates to appearance, with women being more concerned with their appearance at the time of discovery and in the coffin than men (Lester, 1969). Lester cites a study by

Diggory and Rothman (1961) as support for this; in this study, findings indicated that men were not as concerned about their appearance post-mortem as women were.

There is also speculation that the gender difference has more to do with intent than active versus passive and appearance. It has been hypothesized repeatedly that women choose means of lower lethality (i.e. means of suicide where there is a higher likelihood of rescue such as cutting the wrists or overdosing) as more of a cry for help or a means to manipulate others. Contrastingly, in this theory, men have a stronger intent to die and therefore choose means that are more lethal and reduce the likelihood of reversibility or rescue (Maris, Berman, & Silverman, 2000). However, Lester (1969) contends that this theory of women being less intent on dying than men cannot explain the gender phenomena entirely because within each method, whether active or passive, men die by suicide more than women.

Prevalence of Suicide in Louisiana

In 2002, the state of Louisiana's rate of suicide was 11.1 per 100,000, which is comparable to the national rate (11 per 100,000). Out of the 50 states and the District of Columbia, Louisiana ranks 31st in the nation for deaths by suicide (McIntosh, 2004a). Table 2 shows summary suicide statistics for the years 1996 through 2002 for the state of Louisiana; all are compiled from official data analyzed by McIntosh (1998a, 1999a, 2000b, 2001a, 2002a, 2003a, 2004a) for the American Association of Suicidology.

Prevalence of Suicide in the Selected Metropolitan Parish (County)

In the selected metropolitan parish (county) in Louisiana, the coroner's office is responsible for investigating deaths that are suspected to be suicides. From 1991 to 2000, suicide accounted for 1.9% of deaths ($n = 452$) that were investigated by the

coroner's office. While nationally suicides outnumber homicides by a third (Goldsmith et al., 2002), this is not the case in Louisiana where homicides outnumber suicides at approximately a 2:1 ratio. Male suicide victims accounted for 355 deaths by suicide (78.5%) and the remaining 97 (21.5%) were female. The majority of suicides during this 10-year period ($n = 342$, 75.7%) were of White ethnicity. The remaining 110 suicide cases (24.3%) investigated were of minority ethnicity (103 suicides of black people, 7 suicides from all other ethnicities combined; sub-categories of minority ethnicities were not reported by Dimattia) (Dimattia, 2002). In Dimattia's descriptive analysis of coroner death investigations over a 10-year period, firearms were the methods used in 70% of the deaths by suicide. The next most prevalent method was hanging (11%).

Table 2
Summary Suicide Statistics for Louisiana, 1996 through 2002

	1996	1997	1998	1999	2000	2001	2002
Rate	12.2	12.1	11.0	11.8	10.7	11	11.1
State Ranking	27th	26th	35 th	22nd	35th	34th	31st

^a Per 100,000.

The first year (1991) of the 10-year distribution Dimattia (2002) studied contained the most suicides ($n = 54$) and the year 2000 had the least ($n = 27$); the remaining years' rates were fairly steady in number of suicides per year ($M = 42$, SD not reported). Using the formula in Figure 2 used by McIntosh (2004a) for calculating rates of suicide to convert Dimattia's findings (which were not reported per 100,000), the average rate of suicide for the parish (county) of interest for this study over the 10 year period of 1991 to 2000 was 10.6 per 100,000, comparable to the state (11.1) and national (11) rates.

$$\text{suicide rate} = \frac{\text{number of suicides by group}}{\text{population of group}} \times 100,000$$

Figure 2. Formula Used for Rate of Suicide Calculation in Study Parish (County).

Suicide as Escape: Supporting Patterns

As noted previously, the theory that many suicides are a means of escaping one's own hopelessness, is supported in the literature. This section of the review of related literature will discuss patterns found to be significant for the understanding of suicide as escape.

Temporal Distribution of Suicide

As cited by Baumeister (1990), important support for the escape theory includes certain temporal phenomena observed in the rate of suicide. Two of the first to look at temporal patterns of suicide were Morselli (1881) and Durkheim (1897/1951/1979). Morselli observed an increase in suicides during the late spring and early summer months among the majority (88%) of 18 European countries he studied. In Durkheim's landmark work, *Le Suicide* [Suicide: A Study in Sociology] (1897/1951/1979), he defines suicide on a number of levels including a detailed discussion of climatic and seasonal variations in the rates of suicide across various European countries. In terms of climatic differences, Morselli noted that in Europe there was a pattern that could be defined based on latitudes of areas. The more central area of the region, which was characterized by a milder climate, had higher concentrations of suicide. Additionally, when the northern and southern regions, with fewer suicides were further divided along

latitudes, the latitudes closer to the central regions in both the northern and southern regions had higher incidences of suicide than the latitudes further away. Morselli posited that the more moderate the climate, the more likely a flourishing of suicides would emerge.

Durkheim's response to this noted pattern is the existence or incidence of suicide in all climates. Durkheim suggested that rather than being related to clemency of weather, the variations in incidence of suicide observed across latitudes was linked to the social nature of the areas. The central areas or latitudes with a higher incidence of suicide were also the two principal centers of European civilization at the time. Durkheim emphasized that this, coupled with the phenomenon of increasing suicide rates as one moved closer to these central regions from the northern and southern regions of Europe, was likely a function of social interaction patterns and cultural similarities among the people of these regions than climate. He recommended that studies be focused on the nature of these civilizations rather than the climate. In summary, Durkheim challenged his readers to consider:

Is it not more probable that the ideas and sentiments, in short, the social currents so strongly influencing the inhabitants...to suicide reappear in the neighboring countries of a somewhat similar way of life but with less intensity? Another fact shows the great influence of social causes upon this distribution of suicide. Until 1870 the northern provinces of Italy showed most suicides, then the center and thirdly the south. But the difference between North and Center has gradually diminished and their respective ranks have been finally reversed...yet the climate of the different regions has remained the same. The change consists in the movement of the Italian capital to the center of the country as a result of the conquest of Rome in 1870. Scientific, artistic and economic activity shifted in the same manner. Suicides followed along (p. 106).

Morselli's (1881) investigation of climate included a more focused review of incidences of suicide based on seasons and the resulting changes in temperature. He

noted a rise in suicide during the six warmest months, March through August. Specifically defining Winter as December to February, Spring as March to May; Summer as June to August and Fall as September to November, he observed that the Summer months had the most suicides in almost every country he studied ($\underline{n} = 30$, 88%). In the remaining 12% ($\underline{n} = 4$) of the countries studied, there were reporting issues making the verity of the results questionable. Morselli posited that increased heat may increase the likelihood of suicide.

Durkheim (1897/1951/1979) retorts that this phenomenon could also be observed in the wake of extremely cold temperatures, leading one to hypothesize that the same increases should be noted during harsh winters. To the contrary, Morselli (1881) notes that winter months had fewer suicides. Durkheim also highlights that if temperatures were a factor, countries with similar temperatures would produce similar proportions of suicide, which they did not. Durkheim hypothesized that the seasonal variations had some other explanation than the temperature changes. He further investigated the incidences of suicide by month of the year. Here he found that regardless of temperature, the countries studied experienced the same patterns, defining all European countries as following the same "law": *"Beginning with January inclusive, the incidence of suicide increases regularly from month to month until about June and regularly decreases from that time to the end of the year"* (p. 111). Because these observations were so highly consistent among countries with different temperature patterns, Durkheim posited that these patterns must be due to some other factor that varies with month of the year. This factor may be responsible as well for a slight pattern Durkheim notes in terms of day of the week: suicide rates tended to be

fairly consistent Monday through Thursday then decrease on Friday and slowly return to the consistent rate observed Monday through Thursday. Durkheim theorized that these patterns observed in the rate of suicide across seasons, months of the year and days of the week can all be explained by differences in activity with times with increased activity having increased rates of suicide and times of more rest, less activity, and thus more social interaction such as the weekends having fewer suicides.

Temporal distributions have continued to be a minor focus in the literature as one piece of the picture needed to understand suicide. Phillips, a leading researcher in temporal distribution of suicide, and Ryan (2000) contend that it is probably a more important key to understanding suicide than most would deem it. They support their argument citing that, though research has found certain biological patterns in suicide, there are patterns in temporal variation, such as those discussed in this section that cannot be explained by internal risk factors.

These additional investigations support that internationally, suicides tend to peak in late spring and in some areas, a second peak is observed in the autumnal months. Additionally, Monday seems to be the most common day for suicides (Massing & Angermeier, 1985). Specifically in the United Kingdom, Australia, Finland, and Italy, peaks are observed for both males and females in Spring with an additional slight peak for females in Autumn (Barracough, & White, 1978; Eastwood & Peacocke, 1976; Meares, Mendelsohn, & Milgrom-Friedman, 1981; Micciolo, Zimmermann-Tansella, Williams, et al., 1989; Nayha, 1982, 1983; Parker & Walter, 1982). In the United States, the same late spring peak is observed for both genders (Lester, 1971; Lester & Frank, 1988), typically during April and May and Monday is also the most common day for

suicides (Lester, 1979; MacMahon, 1983; Maldonado & Kraus, 1991; Phillips & Ryan, 2000). In a study focusing on temporal distributions of suicide among alcoholics, the same Monday peak was also noted (Bradvik & Berglund, 2003). Campbell and Lester (1996) conducted similar analyses with eleven years of suicide data (1984 to 1994) for the parish (county) of interest of this study and found that the months with the most suicides were January and April; seasonally, the distribution peaks in the winter season (defined as January through March) and dips in the autumnal season (defined as October through December). There was no particular day of the week that was found to be a statistically significant “peak” day though Wednesdays and Fridays were the most common days and Sundays least common (Campbell & Lester).

In 1995, Steven Stack published his findings looking at what he termed temporal disappointment, based on Gabennesch’s theory (1988), and its effect on suicide rates. Gabennesch’s theory resembles Baumeister’s (1990) theory of suicide as escape. Stack extrapolates that Gabennesch’s theory explains springtime, Monday, and holiday suicide peaks as being due to

an unfavorable contrast between raised expectations and stubborn reality. The gap experienced by suicidal people involves how they expect to feel and how they actually feel at these times. If an impending event such as a holiday subtly increases expectations without actually improving the life of a suicidal person, then his or her mood does not necessarily return to its original condition during the event or after it is over. Instead, once the sense of relative deprivation is realized, the event such as springtime or a holiday may actually intensify suicidal feelings (p. 314).

In investigating this theory, Stack included the variable of ethnicity (which he defined as White or Nonwhite); up until this study, ethnicity was an often overlooked demographic attribute when looking at the temporal distribution of suicide. Stack’s results indicate that holidays (specifically investigated were Memorial Day, Fourth of July, Labor Day,

Thanksgiving, Christmas, and New Year's Day) are times of decreased suicide for both Whites and Nonwhites. Confirmed in this study is that springtime, a time of increased expectations for a time of flourishing, is a time of increased suicide among both Whites and Nonwhites. For Whites, Mondays were days of increased suicides but not for Nonwhites. For Nonwhites, the only noticeable pattern noted was that Tuesdays and Thursdays seem to yield the fewest deaths by suicide.

In a study looking at the theory that suicides increase at the end of the month (this theory was suspect due to methodological issues in previous studies that were corrected in this study), Phillips and Ryan (2000) used a sample of 411,853 suicides from 1973 to 1988 in the United States. What they found was that suicide levels actually decline as the end of the month approaches and then increase suddenly at the beginning of the month and for the next 14 days. This was found consistently for males and females of almost all ages (the exception was the female group aged 35 to 49).

Despite the presented observed patterns related to temporal variations including time of the year (seasons), time of the week, and time of the month, other, more recent studies support a diminishing effect of seasonality on the temporal distribution of suicide. In a study of suicides in England and Wales from 1982 to 1996, Yip, Chao, and Chiu (2000) found that their analyses did not support the seasonal trends observed in similar studies of England and Wales using data from 1960s and 1970s (Barraclough & White, 1978; Meares et al., 1981). Specifically, Barraclough and White found that seasons explained 49.3% of the variance in the temporal distribution of suicides. Yip et al. find that in their sample, only between 15 and 17% (depending on gender) of the variation is explained by seasonal fluctuations. Similar findings have been reported by

Ho et al. (1997) for Hong Kong and Taiwan explaining between 25 and 32% of the variance and by Yip et al. (1998) for Australia and New Zealand accounting for 3 to 17% of the variance. Yip et al. (2000) propose that this disappearing effect of seasonality may be due to an increased connectedness among people due to advances in communication including mobile phones, email, and the internet. They hypothesize that variations due to seasonality will “disappear in the new millennium” (p. 368).

Clustering and Contagion

When looking at temporal distributions of suicide, it is logical to also investigate for contagion or clustering. This is supported by Durkheim's (1897/1951/1970) challenge to his readers to look beyond seasonality and actually focus on shared aspects of the civilizations under study. Historically, there are numerous records of clustered suicides documented as escapes from some type of adversity or oppression. One of the earliest documented clusters of suicide, reported by Plutarch, was in Miletus, Greece in the 4th century BC and involved a number of Greek maidens ending their lives by hanging. In 600 BC, there was a clustering of suicides among Roman soldiers during the rule of Tarquinius Superbus. During this time, soldiers were assigned to work in the sewers and many of them suicided probably as a result of this oppression. Horace documented a cluster of suicides at the Fabrician Bridge over the Tiber River during his lifetime (65 BC to 8 BC). While Claudius I ruled Rome (41-54 AD), Seneca the Younger described clusters of suicide and later died by suicide himself (Coleman, 1987).

Looking at religious groups and escape from religious persecution, suicide clusters have been noted throughout history. For example, there was a mass suicide of Jews who were defending Masada from the Romans in 73 AD (Manicelli, Comparelli,

Girardi, & Tatarelli, 2002) and Josephus, a Jewish historian, noted numerous suicide clusters when Jerusalem fell to the Romans in 63 BC. Early Christianity was replete with martyrs dying for the faith and, subsequently, the deaths of these martyrs incited suicide clusters. One such example is the cluster of suicides that occurred after the martyrdom of St. Ignatius of Antioch. In 410 AD, when King Alaric led his Visigoth army to invade Rome, many Christian virgins and married women killed themselves to avoid being raped by the invaders. In 1190, 600 Jews chose to die by suicide than to renounce Judaism in France; in 1320, another 500 French Jews made the same choice. During the Black Death (bubonic plague), Jews were accused of being the spreaders of the plague and numerous suicides of Jews occurred from 1348 to 1350 in response to this persecution (Coleman, 1987).

Aside from religious persecution, suicide clusters have been noted throughout history as a means of political activism. In the 1960s and 1970s, in the U.S., Czechoslovakia, France, and the United Kingdom, suicide clusters were noted imitating the self-immolation of a Buddhist monk, Thich Quang Duc, protesting the Vietnam War. Considering the notable presence of a clustering or contagion phenomenon, researchers have attempted to classify and organize these occurrences (Coleman, 1987).

One resulting category of contagion phenomena is the Werther Effect. The Werther Effect encompasses the phenomenon that during the period of and following media coverage of suicides, an increase in the rate of suicide is observed. The Sorrows of Young Werther, a novel by van Goethe originally published in 1774, was the impetus for the discovery of this phenomenon. Upon the release of this novel, which details a

suicide down to the garb of the deceased and the placement of the mementos he wished his beloved to find, there were a series of suicides imitating the details of the fictional event in the book. Since then, numerous studies have been conducted in the United States and Europe to investigate the impact of media coverage of suicides on the suicide rate (Phillips & Lesyna, 1995). One study also confirmed the Werther Effect in assisted suicides (Frei, et al., 2003). To summarize the findings of Werther Effect research,

1. Overt and covert [deaths that may be suicides but there is not enough evidence to decide for certain; e.g. single motor vehicle accidents, small aircraft crashes] suicides rise significantly after publicized suicides.
2. The more publicity given to a story, the greater the rise in suicides thereafter.
3. The rise is greatest where the story is most heavily publicized. To date, the only explanation ... is that suicide stories trigger imitative behavior (Phillips & Lesyna, 1995, p. 236).

Aspects of media coverage that increase the risk for contagion for all ages include: simplistic explanation for suicide; excessive coverage of suicide; sensationalized coverage including morbid details and dramatic photos; reporting the method and the details; presenting suicide as an effective coping strategy; glorifying or awarding celebrity status to the victim with public memorials and other displays; and focusing on the victim's positive characteristics (Grossman & Kruesi, 2000). Youth seem to be particularly at risk for contagion with an estimated 5% of youth suicides occurring in clusters due to media attention of previous suicides (Gould & Shaffer, 1986; Gould, Wallenstein, & Kleinman, 1990; Phillips & Carsensen, 1986).

An effect similar to the Werther Effect is the Cobain Effect. This effect was identified after the suicide of rock star Kurt Cobain in 1994. Due to the Werther Effect, there was much concern voiced by the general public that Cobain's suicide would cause

a contagion in the youth population of the Seattle area where he killed himself. Cobain's suicide was followed by media attention referring people to the local crisis center and its hotline and a candlelight vigil where his wife expressed her grief over his death. What was observed after the death was not a rise in the suicide rate as is observed with the Werther Effect but rather an increase in suicide phone calls to the local crisis center hotline (Jobes et al., 1996).

Demographic Patterns

As noted in reviewing the prevalence of suicide, there are certain demographic trends that are observable and have been noted throughout the suicidology literature for many years. Trends relevant to this literature review include age patterns and differences across gender and ethnicity. These are discussed in more detail in this section specifically in relation to the United States though many of these trends are noted globally.

Age

In the U.S., the most distinct patterns across studies of suicide are the concentrations of suicides among the advanced in age and the young. Suicide rates are growing especially rapidly in these groups. A 20-year prospective study of psychiatric outpatients who ultimately died by suicide conducted by Brown et al. (2000) identified increasing age as a statistically significant risk factor ($p = 0.008$) for death by suicide. The highest rates of suicide are found among those 75 and older (Pearson, 2000) both in the U.S. and in a majority of industrialized nations (Pearson, Conwell, Lindsay, Takahashi, & Caine, 1997) with an older person completing suicide every 94.7 minutes

in 2002 (McIntosh, 2004b). For males 85 years and older, the rate of suicide is 65 per 100,000 which is almost six times the rate of suicide for all ages combined in the U.S..

Reviewing the existing theories for increasing suicide rates among the elderly, there is a pattern of ideas that ultimately reduce to Baumeister's general theory of suicide as escape. Support for this includes that risk for older adults seems to be higher for unmarried older adults than for married ones (Pearson, 2000) where suicide could be an escape from the loneliness and despair of losing a life-partner to death. In Maris, Berman, Silverman, and Nisbet's (2000) summary of elderly suicide, it is plausible that suicide can be a perceived means of escape from each of the circumstances described:

not only does our life tend to run out (like sand in the 'hourglass' of a lifetime), but also its quality tends to diminish over time. Usually, with age health wanes, depressive disorders increase, there are profound social and interpersonal losses (e.g. through death of a spouse or divorce), alcohol abuse may become 'terminal,' and, perhaps most crucial, hopelessness may set in (p. 127).

The other rapidly increasing group of age-related suicide patterns involves the young. The United States has the highest rate of youth suicide compared to 26 other westernized countries (without taking into account variances in reporting procedure) (Grossman & Kruesi, 2000) and it has been on the rise since the 1950s. This rise is estimated to be anywhere from 237% to 323 % (Maris, Berman, Silverman, & Nisbet, 2000). For young people, suicide is the third leading cause of death after accidents and homicides. Every two hours and eleven minutes, there is one suicide of a person between the ages of 15 and 24. If children under the age of 15 are included in this group, there is a suicide every two hours and three minutes of a person under the age of 24 (McIntosh, 2004b).

Though it is commonly thought that youth suicide includes only adolescents, suicidal thinking, threats, attempts and deaths by suicide are observed among prepubertal children (Pfeffer, 1986, 2000) with roughly 1 suicide per 100,000 as the rate for 2001 among 5-14 year olds (McIntosh, 2004b). The National Center for Health Statistics (NCHS) did not report suicide prevalence for children in this age group until 1970 (0.3 per 100,000) and by 1986, it had increased 267% (0.8 per 100,000) (Maris, Berman, Silverman, & Nisbet, 2000). Suicide as escape here is also plausible. Risk factors that seem to contribute to suicide among these children include stressful life-events, major depressive disorder, poor social adjustment, physical and sexual abuse, and family problems (Pfeffer, 2000).

Adolescent suicide has long been a concern and focus in the literature. In response to this and to the staggering fact that suicide is the 3rd leading cause of death for youth, when the U.S. Centers for Disease Control and Prevention (CDC) began administering the Youth Risk Behavior Surveillance Surveys (YRBS), items relating to suicidality were included. The survey is given biennially to a representative sample of ninth to twelfth grade students. Survey results from the 2003 YRBS (CDC, 2004b) administration are illustrated in Table 3.

The 15 to 24 year old age bracket whose 3rd leading cause of death is suicide (McIntosh, 2004b) also encompasses most college students. Recently, this has received increased media attention due to a series of suicides on college campuses. Also, it is noted in the research on suicidal ideation, that 18 to 24 year olds have the highest rate of suicidal ideation as compared to other adult aged groups (Crosby, Cheltenham, Sacks, 1999). A study by Strang and Orlofsky (1990) showed that 61% of

college students had considered suicide. In another study of college students, regardless of gender, Barrios, Everett, Simon and Brener (2000), found that 2.1% had attempted suicide at some point (with 0.4% requiring medical intervention), 7.9% had developed a plan to end their lives, and 11.4% had considered suicide translating to approximately 1 of every 10 college students considering suicide per year.

Table 3
U.S. Youth Risk Behavior Surveillance Survey 2003 Results Related to Suicide

Survey Item	Females			Males			Total
	Black	Latino	White	Black	Latino	White	
Seriously considered suicide during previous year	14.7%	23.4%	21.2%	10.3%	12.9%	12.0%	16.9%
Made a suicide plan during previous year	12.4%	20.7%	18.6%	8.4%	-	13.9%	16.5%
Attempted suicide during previous year, at least once ^a	9.0%	15.0%	10.3%	7.7%	6.1%	3.7%	8.5%
Had felt sad or hopeless during previous year	30.8%	44.9%	33.3%	21.7%	25.9%	19.6%	28.6%

Note. The dashes indicate data that were not reported.

^a2.9% of attempts required serious medical attention

A wide variety of explanations have been suggested for youth suicide, most having to do with adjustment to significant life changes or stressful life events (King, 1997; Lewinsohn, Rohde, & Seeley, 1994; Portes, Sandhu, & Longwell-Grice, 2002)

which implicates Baumeister's escape theory (1990). Among the typical explanations are the breakdown of interpersonal relationships (e.g. with parents, peers, and significant others) (Brent, Perper, Goldstein, et al., 1988; Brent, Perper, Moritz, Allman, Friend, Roth, et al., 1993; Buelow, Schreiber, & Range, 2000; McIntosh, 2000a; Strang et al., 1990); loss of a parent to death or other time extensive separation (Bron et al., 1991); ineffective coping with stress (e.g. pressure to succeed in school, breakdown of the nuclear family) (Maris, 1985; McIntosh, 2000a); biological issues (e.g. puberty); loneliness and isolation (McIntosh, 2000a; Rich, Young, & Fowler, 1986; Shaffer, 2004); identity crisis (Erikson, 1968; Maris, Berman, Silverman, & Nesbit, 2000; Portes et al., 2002); and mental illness (Kovacs, Goldston, & Gatsonis, 1993; Maris, Berman, Silverman, & Nesbit, 2000; McIntosh, 2000a; Shaffer, 2004). It is suspected that the increase in youth suicides over the past half-century may also be due to increased use of drugs and alcohol (Brent, Perper, & Allman, 1987; King, 1997; McIntosh, 2000a; Rich et al., 1986; Shafi, Carrigan, Whittingill, & Derrick, 1985); less involvement in religion; and increased stresses of living in and having to adapt to an ever changing industrialized society (McIntosh, 2000a).

Of course, suicide is not only noted among those under age 24 and over age 65, though looking at the attention given to these two groups in the research (Maris, Berman, Silverman, & Nesbit, 2000) and the media, one might erroneously arrive at that conclusion. For victims of suicide between the ages of 24 and 65, research points most often to the presence of stressful life events such as divorce or loss of a significant other (Heikkinen & Lönnqvist, 1996; Maris, Berman, Silverman, & Nesbit, 2000; Slater & Depue, 1981) and job stress including loss of a job, career identity crisis, and conflicts in

the workplace (Heikkinen & Lönnqvist, 1996; Maris, Berman, Silverman, & Nesbit, 2000). Here, alcoholism is also implicated (Barraclough, Bunch, Nelson, & Sainsbury, 1974; Borg & Stahl, 1982; Conwell, et al., 1996; Hirschfeld & Blumenthal, 1986; Roy, 1982; Stillion, McDowell, & May, 1989) perhaps because it is often a relied upon, “old friend” when coping with crisis (Maris, Berman, Silverman, & Nesbit, 2000).

An ongoing theme, regardless of age, is the idea that negative life events play a role in a person’s decision to die by suicide, ultimately escaping the consequences of the event. Heikkinen and Lönnqvist (1996) conducted a nationwide study in Finland comparing people who were victims of suicide ages 20 to 59 ($n = 803$) to victims ages 60 and older ($n = 219$) on life events. They found that, within three months of the suicide, when condensing the groups ($n = 1022$), 80.8% had experienced an event that could be classified as a negative life event. The most prevalent of these were job problems (28.1%), family discord (23.4%), and somatic illness (22.3%).

Gender and Ethnicity

Because gender trends typically vary by ethnicity within the study of suicide, these two demographic variables will be discussed jointly. As has been noted before, globally, except in China, women attempt suicide more than men but men die by suicide more than women (Goldsmith et al., 2002; Lester, 1988a; Maris, Berman, Silverman, 2000). In the United States, this is especially amplified among older adults where males between 65 and 74 years of age are six times more likely than females to die by suicide; between ages 75 and 84, nine times more likely and over 85 years of age, 14 times more likely. Similarly, among youth, males 15 to 24 years old were almost six times

more likely to kill themselves than their female counterparts (Maris, Berman, Silverman, 2000).

Overall, suicide rates among males in the United States have been consistently increasing since the 1970s while female rates have been decreasing since that time. Suicides among White females have declined by 33% since 1970 and by 24% among Nonwhite females; this is an overall 35% decrease in suicide rates among females. White male suicide rates have increased since 1970 by 15% and Nonwhite male suicide rates have increased by 10%. This accounts for an overall 12% increase in male suicides. As one would expect based on already cited trends, the largest increases among male suicides are in the adolescent group (ages 15 to 19) with White suicides in this group increasing by 103% and Nonwhite suicides among the same ages increasing by 144% (Maris, Berman, & Silverman, 2000). A majority of suicides (80%) were White males in 2002 (McIntosh, 2004). Black males die by suicide six times more than Black females whereas White males die four times as often by suicide as White females do. White females die by suicide twice as often as Black females do (Maris, Berman, & Silverman, 2000) and Black females have continued to have the lowest rate of suicide in the United States (1.5 per 100,000) (McIntosh, 2004). White males die by suicide approximately 67% more often than non-White males. For Asian Americans, the rate of suicide in 2002 was 5.2 per 100,000 ($n = 661$) and for Native Americans, 10.5 per 100,000 ($n = 324$). Among Latinos, McIntosh (2004) cites a rate 5 suicides per every 100,000 ($n = 1954$) (Gender distribution is not given for Asian Americans, Native Americans, nor Latinos). However, results of the YRBS indicate that these rates may be an underestimate, especially among Latino youth. Among Native Americans, suicide is

substantially higher than the general population especially among youth ages 15 to 24 with the ratio of male to female suicide being 7:1 (Maris, Berman, & Silverman, 2000).

One proposed reason or theory for the differences in suicide rates by gender has to do with response to feelings: in the U.S. and many other cultures, males are encouraged to be stoic whereas women are taught to be expressive (Portes et al., 2002). It is suspected that this encouragement to be expressive of emotions facilitates help-seeking and also the establishment of effective relationships with mental health practitioners which can be a protective factor against death by suicide. Contrastingly, the socialization of men to be stoic impedes not only their ability to seek help (which is deemed socially unacceptable in a stoic male culture) but also compromises their willingness or ability to develop the relationship with a mental health practitioner and to divulge their deepest, darkest struggles with hopelessness, depression, and suicidal ideation.

Social Impact of Suicide: Survivors of Suicide

I believe that the person who takes his life puts his psychological skeleton in the survivor's emotional closet. He sentences the survivors to deal with many negative feelings and much more to become obsessed with thoughts regarding their own actual or possible role in having precipitated the suicide act or having failed to abort it. It can be a heavy load (Shneidman, 1972, p. x).

As Shneidman points out, suicide has detrimental effects on those exposed to it with their likelihood of dying by suicide increasing dramatically (Cain, 1972). It is estimated that each suicide in the United States leaves between six (Shneidman, 1969) and twenty-four survivors (Campbell, 2001b) to grieve the loss of a loved one to this tragic cause of death. The estimate of six survivors to every suicide was initially calculated by Edwin Shneidman using statistics from a plane crash indicating that there

were an average of six survivors left for each person who died in the crash (Linn-Gust, 2004). The estimate of twenty-four survivors to every suicide is based on Campbell's findings from a study of postvention with survivors conducted at a crisis center serving survivors of suicide in the Louisiana parish (county) of interest for this study (Campbell, 2001b).

Research on survivors of suicide is still in its infancy but current dabbling has yielded a number of noteworthy revelations (Jordan, 2001; Lubell, 2003). Jordan (2003) identified themes that are recurrent in the existing survivor of suicide literature. These themes, or difficulties encountered by most survivors of suicide, include shame due to the stigma of suicide, risk for developing PTSD (especially if the survivor found the deceased [Callahan, 2000]), feeling abandoned and rejected often resulting in negative feelings toward the deceased, and a need to answer the question "why". This "why" is evident in how Campbell (2001a) has come to describe the survivor's plight after over 15 years of working with survivors of suicide. As he puts it, survivors find themselves in a "Canyon of Why" where "The person who is surviving the suicide of another was plunged into this canyon without a choice and is immediately being swept by the current toward the fork in the river" (p. 97). That fork in the river could literally become a choice between life and death.

It is estimated that once a person becomes a suicide survivor, his or her risk of dying by suicide increases nine times (Cain, 1972) because, unintentionally, once a person becomes a survivor of suicide, suicide as a coping mechanism becomes an item in the person's coping toolbox (Dunne & Dunne-Maxim, 1987; Roy, 1992). In a study of adolescent survivors, it was found that adolescents experiencing grief due to the suicide

of a close friend (grief due to a suicide is usually termed complicated bereavement) were five times more likely to think about suicide than peers who were experiencing grief due to some other loss. To further investigate this, the effects of depression and gender were controlled and the phenomenon remained (Prigerson, 2003). Brent, Moritz, Bridge, Perper, & Cannobio (1996) found an increase in suicide attempts among siblings as well in a three-year study of families of adolescents who had died by suicide even after controlling for psychiatric disorders. Among young White and Black males (20-35 years of age), who lost wives to suicide, risk for dying by suicide increases from 1 in 9000 in the general population to 1 in 400 (Luoma & Pearson, 2002). Finally, in a study of college students, structural equation modeling indicates that exposure to both suicide attempts and suicide deaths increases suicidality across ethnicities (Gutierrez, Rodriguez, & Garcia, 2001).

Mary Stephanie Hutchinson (2001), who lost her son to suicide, conducted a qualitative study of the experience of the bereaved that sheds light on why suicide survivors experience complicated bereavement. Through interviews with facilitators of survivor of suicide support groups in Ireland, Hutchinson found that society, with the stigma it assigns to death by suicide, can be a hindrance in the grief process for survivors; police and media exacerbate the trauma and are often the stigma incarnate; and support for the bereaved in the case of death by suicide was of a lesser quality and quantity than support experienced by people who had experienced losses to other causes of death. Other research too has focused on whether bereavement after a suicide is different than after other causes of death. Though the number of studies finding that it is different is almost proportionate to the number of studies showing that it

is not different (Sheehy, 2001), it is still important to look at what might be the differences in bereavement.

The theme of rejection and abandonment is supported in much of the research (e.g. Bailey, Kral, & Dunham, 1999; Barrett & Scott, 1990). Shame and stigma likewise continue to appear in the findings of research on survivors (Bailey et al., 1999; Calhoun, Selby, & Abernathy, 1984; Calhoun, Selby, & Steelman, 1989; Campbell, 2000; Farberow, Gallagher-Thompson, Gilewski, Thompson, 1992b; Hutchinson, 2001). Survivors feeling as though there is a shared responsibility in the suicide or feeling to blame for the death is commonly found in the literature as well (Allen, Calhoun, Cann, & Tedeschi, 1993; Campbell, 2000; Knight, Elfenbein, Messina-Soares, 1998; Ness & Pfeffer, 1990).

Increased incidence of depression is noted among survivors of suicide as compared to bereaved of other causes of death and this is especially noted among children and adolescents (Brent, Perper, Moritz, Allman, Friend, Schweers, et al., 1992; Brent, Perper, Moritz, Allman, Liotus, et al, 1993; Brent, Moritz, et al., 1996; Pfeffer, Karus, Siegel, & Jiang, 2000). For mothers in particular who lose a child to suicide, incidence of major depressive episodes was higher over both a 6-month (Saarinen, Viinamäki, Hintikka, Lehtonen, & Lönnqvist, 1999) and three-year follow-up as compared to controls; fathers shared this increased incidence but results were not statistically significant (Brent, Moritz, et al., 1996).

In separate studies, Cerel, Fristad, Weller, and Weller (1999), Pfeffer et al. (1997) and Pfeffer et al. (2000) found that youth who experienced a loss of a parent to suicide were more prone to anxiety and anger as compared to youth who had lost a

parent to another cause of death; no differences were found in incidence of depression. Brent, Moritz et al. (1996) found higher instances of Generalized Anxiety Disorder (GAD) among siblings of adolescents who had suicided as compared to controls. Elderly who lose a partner to suicide struggle more with the loss than people who lose a spouse to other types of death (Farberow, et al., 1992a). Spouses of a person who died by suicide are found to be more likely to develop PTSD than spouses of people dying from a chronic illness (Zisook, Chentsova-Dutton, & Shuchter, 1998). Grief reactions in general to the loss of a loved one by suicide were found to share characteristics with PTSD (Bengesser & Sokolof, 1989; Range, 1998).

Risk Factors

The search for risk factors for suicide is a somewhat frustrating endeavor. It seems that risk factors overlap and coincide, are significant in some cases and not so in others. The search for the one key factor common to all suicide victims that could be addressed to prevent future deaths by suicide has led to a smorgasbord of possibilities dependent upon situations, some treatable, some not. Risk factors such as biological factors and mental illness have been identified yet not with the consistency and predictability of hopelessness though hopelessness is often found to be a contributing component of some of these other risk factors (Goldsmith et al., 2002). Commonly researched risk factors are addressed briefly. Gender has been found to be a factor within each of the risk factors to be discussed (Maris, Berman, & Silverman, 2000) and is therefore addressed throughout this discourse.

Biological Risk Factors

When Durkheim (1897/1951/1979) wrote his piece on suicide, other theorists had already begun to investigate biological or genetically heritable traits that might predispose someone to suicide. Durkheim's initial theories related to the then limited understanding of race which he defined as "individuals with clearly common traits, but traits furthermore due to derivation from a common stock" (p. 82-83). Recent research has revealed that there are indications that certain biological issues may result in alterations in how people handle stress and depression (Goldsmith et al., 2002) though no suicide gene has been identified (Lester, 1997). In a study of suicidality among monozygotic and dizygotic twins, Statham et al. (1998) found that genetic factors contributed to 45% of the variance. In two more studies of twins, Segal and Roy (1995, 2001) found similar support for a genetic predisposition to suicidality. This predisposition may be more closely related to a genetic predisposition to mental illness and/or impulsivity (Goldsmith et al., 2002). Twin and adoption studies support this genetic predisposition to mental illness and also to alcohol and substance abuse (Cooper, 2001; McGuffin & Katz, 1989; McGuffin, Katz, & Rutherford, 1991).

Specifically, this genetic predisposition may manifest as an abnormal functioning of the hypothalamic-pituitary adrenal axis (HPA), which assists in the process of handling stress (Goldsmith et al., 2002); a decrease in norepinephrine, also integral in handling stress (Goldsmith et al, 2002; and a decrease in serotonergic functioning which has been well-documented in the literature over the past forty years (American Foundation for Suicide Prevention [AFSP], 2004; American Psychiatric Association [APA], 2000; Goldsmith et al., 2002; Joiner, Johnson, & Soderstrom, 2002; Korn,

Brown, Kotler, Gordon, & van Praag, 1995; Malone & Mann, 2004; Mann, 1987; Mann, 2004; Maris, 2002).

This is an important finding because decreased serotonergic functioning is implicated in depression (Malone & Mann, 2004; Goldsmith et al., 2002), alcoholism, and other mental illnesses (Mann, 2004; Goldsmith et al., 2002). This information provides support for treatment of depression on the biological level using antidepressants in addition to traditional therapeutic relationships with mental health practitioners. Low serotonergic functioning also results in increased impulsivity, which, like alcohol and substance abuse, may increase a person's risk of dying by suicide. There is budding research too that decreased norepinephrine may be a factor among those who die by suicide because of its relation to how a person handles stress (Goldsmith et al., 2002).

Mental Health

Current estimates indicate that over 90% of people in the U.S. who suicide have a mental illness and/or alcohol and substance abuse issues (Goldsmith et al., 2002; Barraclough et al., 1974; Harris & Barraclough, 1997; Harris & Barraclough, 1998). However, it is important here to emphasize that this accounts for only 5% of people diagnosed with a mental illness; 95% of those diagnosed with a mental illness never kill themselves (Goldsmith et al., 2002). In a review of psychological autopsy studies, Cavanagh, Carson, Sharpe and Lawrie (2003) found that mental illnesses and substance abuse were the most consistently found factors among suicides studied. Some of the most prevalent mental illnesses found among people who kill themselves

are depression and anxiety disorders, including post-traumatic stress disorder (PTSD) (Goldblatt & Silverman, 2000; Seligman, 1998).

Depression (which actually encompasses a variety of mental illness diagnoses) is classified in the Diagnostic and Statistical Manual of Mental Disorders IV-TR (DSM-IV-TR) as Mood Disorders and has the primary feature of a disturbance in mood (APA, 2000). Some diagnoses within the Mood Disorders category are Major Depression, Dysthymia, and Bipolar Disorder. Depression as measured by the BDI has a substantial positive correlation with suicide intent ($r = .57$) (Kovacs, et al., 1975). In 1991, a study by Robins and Regier estimated that 9.5% of the U.S. population, roughly 18.8 million citizens, suffer with depression. This estimate is not well-received given sampling issues interfering with generalizability (Blazer, Kessler, McGonagle, & Swartz, 1994). The National Comorbidity Survey was designed to correct these methodological issues. It revealed a number of patterns about depression among Americans: a) there is a 4.9% prevalence of a single major depressive episode and a 17.1% prevalence of lifetime major depression; b) women are twice as likely as men to experience single depressive episodes and/or lifetime major depression regardless of ethnicity; c) Latinos are twice as likely as Blacks to experience depression regardless of gender and d) Blacks have the lowest overall prevalence of lifetime depression. The National Comorbidity Survey also yielded important information about risk factors for depression. The risk factor profile extracted shows that there is a higher likelihood for depression among younger people, women, people with low socioeconomic status; people who are divorced or separated; and people living in urban areas.

Depression is also a risk factor in suicides among the aged. According to Pearson (2000), it is more likely that elderly people who die by suicide experienced depression than it is that younger people did. For these elderly victims of suicide, the depression is usually a first episode which is the most treatable type of depression found among the elderly because it is uncomplicated by psychosis or other comorbid psychiatric disorders (e.g. anxiety disorder, personality disorder). Despite this knowledge that depression is an underlying factor for suicide, especially among the elderly, primary care physicians fail to address this due to the misconception that depressive symptoms and suicidal ideation are part of the aging process. This oversight is disarming since more than 70% of older people who killed themselves saw their primary care physicians within a month of their deaths. While one might question whether this is complicated by dementia and delirium, few studies have found these to be risk factors in suicide though the prevalence of these increases with age.

According to Seligman (1998), "Primary symptoms of depression are feelings of discouragement and hopelessness, a dysphoric mood, a loss of energy, and a sense of worthlessness and excessive guilt. Physiological symptoms are common and typically include changes in appetite and sleep" (p. 151) often precipitated by a stressful event in the person's life. Brown et al. (2000) in their 20-year prospective study found major depressive disorder and bipolar disorder (both having the features described by Seligman [1998]) to be risk factors for suicide with high statistical significance ($HR = 3.19$, $p = .004$ and $HR = 3.57$, $p = .012$ respectively). Pfeffer (1986) found that the presence of mood disorders such as depression resulted in a 30 times higher likelihood

of dying by suicide among children. However, depression is often not diagnosed or, if diagnosed, not treated properly (Isaacson & Rich, 1997).

Anxiety is another category of mental illnesses often associated with suicide (Baumeister, 1990) and is frequently caused by stressful events in a person's life. While anxiety is a normal and adaptive response to stress, if this response begins to cause distress and interfere with one's activities of daily living (e.g. eating, sleeping, working), it is then classified as a mental disorder. According to Seligman (1998), "Anxiety Disorders are among the most prevalent forms of mental illness in the United States" (p. 191) with roughly 8% of U.S. adults having PTSD at some point in their lives. Additionally, anxiety is often comorbid with depression (Kessler, 2001). In this category of mental disorders are Acute Stress Disorder and PTSD. The difference between these is the duration. Acute Stress Disorder typically lasts no more than four weeks; if the symptoms last longer than this time period, the disorder is reclassified as PTSD; Kessler (2000) found in a review of related research, that people who developed PTSD had a higher risk of suicide. He also noted that the nature of the stressful event mediates level of risk with risk almost doubling when the event is human-made as opposed to naturally occurring. In both acute stress disorder and PTSD, the catalyst is usually an event that is experienced as an extreme stressor (e.g. actual or threatened death, witness of death, threats to physical welfare, possibility of serious harm) (APA, 2000). This experience of a stressor may be direct (whether it be experience or observation) or secondary (e.g. being close to someone who experienced or observed the event or experiencing the event through media coverage) (Seligman, 1998). Some examples of extreme stressors include sexual assault, physical assault, combat,

automobile accidents, life-threatening illnesses, and natural and human made disasters (APA, 2000).

Substance Abuse (including alcoholism) is often comorbid with depression and anxiety disorders (Maris, Berman, Silverman, & Nesbit, 2000) and there is an increased risk for death by suicide among substance abusers. (However, among children and adolescents, once depression is controlled, the association between substance abuse and suicidality is not statistically significant [Wu et al., 2004]). Risk is amplified when a person has more than one drug of choice (Borges, Walters, & Kessler, 2000), usually alcohol coupled with another substance (Goldblatt & Silverman, 2000).

“Alcoholism is the third most commonly related factor to adult suicide” and “The majority of alcoholic suicides are middle-age White males between the ages of 45 and 55 years old who have been abusing alcohol for as long as 25 years” (Maris, Berman, Silverman, & Nesbit, 2000, p. 137-138). A study by Roy and Linnoila (1986) estimated that alcoholics are 58 times more likely to die by suicide than the general population and Murphy (1992) estimated that the likelihood is 85 times that of the general population. Alcoholics are overrepresented among suicides as compared to the prevalence of alcoholism in the general population (Hendin, 1995).

Using data from the National Comorbidity Study, Borges, et al. (2000) found that the risk for suicide among substance abusers is likely more closely related to the underlying comorbid diagnoses (e.g. depression, anxiety) rather than the substance abuse alone. Their findings also indicate that there is no difference across substances in suicide risk; this was the case even after controlling for mental illnesses and demographic characteristics. Finally, they reported that risk of suicidality is most closely

related to current use rather than a history of substance abuse. Returning to Baumeister's (1990) theory, it is possible that alcohol and other substances are employed to bring about the numbness referred to in stage five and contribute to one's resolve in stage six due to the decrease in inhibitions that often accompanies substance abuse. This is supported by Borges, et al. finding that current use is the most significant predictor.

Social Isolation

A risk factor that may be pervasive among all the previously discussed risks is social isolation. Social Isolation is a widely acknowledged risk factor for death by suicide first proposed by Durkheim (1897/1951/1979). While it is possible and probable that a person can experience social isolation in an urban or suburban area, rural areas have been found to have an even higher per capita number of people who die by suicide than urban and suburban ones (Singh & Siahpush, 2002). In a study of 27 years of mortality data comparing groups based on a continuum of population density among counties (ranging from rural to urban), Singh and Siahpush found that rates of suicide were higher in rural areas than more urban areas for men and the opposite phenomena was observed for women (findings were statistically significant for many but not all of the years in the study).

Protective Factors

Research in suicidology has investigated protective factors and continues to return to social integration as first posited by Durkheim (1897/1951/1979). This protective factor can take on a variety of forms including family relationships, peer relationships, romantic/life partnerships, and community belongingness. Family

closeness (Marion & Range, 2003; McKeown, et al., 1998) has been found to be an insulator against suicide and, among the elderly, family support specifically is protective (especially if living with spouse, partner, or other family members) (Speice, et al., 2004). With relation to youth suicide, and navigating through the trials of adolescence and identity development, Portes et al. (2002) propose that “a sense of connectedness” is required (p. 805). Greening and Stoppelbein (2002) found that social support, specifically family support, is a buffer for adolescents as well along with high levels of orthodoxy (commitment to core beliefs specifically related to religiosity).

Positive psychology may be the field that yields the most insight into protective factors against suicide. Positive psychology can be defined as “the scientific study of ordinary human strengths and virtues” (Sheldon & King, 2001). In a sub-theory of positive psychology, Fredrickson (2001) suggests that positive emotions (e.g. joy, contentment, love), which are part of the human strengths and virtues encompassed in positive psychology, contribute to a person’s ability to confidently strive to overcome adversities in life. She proposes that this is because adversities are reinterpreted as being opportunities for growth and having potential for positive outcomes. This goes hand in hand with Abramson, Metalsky, et al. (1989) theory of why some people become hopeless after a negative life event and others do not based on the interpretation of the event and its consequential meaning; also supported here is Baumeister’s (1990) contention that not all people going through the stages of his theory will die by suicide. Fredrickson (2001) has integrated this into her “Broaden-and-Build” theory, which posits that cultivation of positive emotions will ultimately result in

resiliency or insulation against the hopelessness that often results from negative life events.

Crisis and Suicide

Factors that may contribute to a person's risk for death by suicide often result in a crisis state, a state where escape is a desired outcome. Crisis can be defined in many ways. James and Gilliland (2001) summarize a variety of different definitions into the following: "crisis is a perception or experiencing of an event or situation as an intolerable difficulty that exceeds the person's current resources and coping mechanisms" (p. 3). For the purposes of this study, Brammer's (1985) definition is also appropriate:

Crisis is a state of disorganization in which people face frustration of important life goals or profound disruption of their life cycles and methods of coping with stressors. The term *crisis* usually refers to the person's feelings of fear, shock, and distress *about* the disruption, not to the disruption itself (p. 94).

Crisis theory poses that crisis is a time of both danger and opportunity for change (James & Gilliland, 2001). Maris, Silverman, Berman and Nesbit (2000) propose that a series of negative life events or crises, may result in a feeling of loss of control or dominion over one's life, frequently culminating in the hopelessness so often correlated with suicide. Suicide then becomes the ultimate act of dominion and reclaiming or asserting power over one's life as explained by Baumeister's (1990) theory of suicide as escape. Contrastingly, as emphasized in Abramson, Metalsky, et al. (1989) theory of hopelessness and Baumeister's theory of escape, hopelessness and suicide respectively are not the only outcomes of these situations. It is possible that the person has sufficient resources (e.g. social supports, optimism, positive life events) and never arrives at hopelessness or suicidality. As previously discussed, these crises that serve as times of both danger and opportunity can be personal in nature but often, there are

community traumatic events that have the potential to be as disruptive as personal crises or to amplify existing personal crises.

Community Traumatic Events: Natural and Human-Made

Community traumatic events (CTE) encompass a wide range of events. These events can be due to natural or human causes. Examples of naturally made CTEs include tornadoes, hurricanes, and blizzards with events like Hurricane Katrina being an extreme example. Recent human-caused CTE examples include the Okalahoma City Bombing, Columbine School Shootings, the September 11 terrorist attacks, and the London bombings of 2005. To qualify as a community traumatic event, the survivors of the crisis find themselves in an overwhelming, often paralyzing situation beyond their immediate control for which they feel woefully inadequate to survive. In the time period after these community traumatic events, there are many factors that may continue to re-traumatize the survivors. The crisis state these survivors are thrust into can have a variety of outcomes, including depression, post-traumatic stress disorder, and suicidality. It is proposed that, outside of the traditionally conceived survivor group—those who were in the midst of the CTE and escaped death—there are four levels of survivorship in community traumatic events: (1) the primary level comprises those who had intimate relationships with the people who lost their lives in the CTE, whether family, friends or other significant relationships; (2) the secondary level consists of those who knew the deceased victims through activities such as work; (3) tertiary survivors are those who share a social or geographic characteristic with the deceased such as being of the same occupation or ethnicity or living in the same community or state; and

(4) quaternary survivors may share the same nationality or other broadly defined characteristic (Zinner, 1985).

In addition to level of survivorship, other factors have been identified as significant in predicting the impact of CTEs on a person's psychological state. Focusing on PTSD, females are more likely to develop this diagnosis than men. Age for women is not associated with likelihood of developing PTSD though it is for males. Ethnicity was not found to have any influence on whether a person develops PTSD or not (Kessler, Sonnega, et al., 1999).

The experiences of people who were in the path of Hurricane Andrew are particularly relevant in creating a picture of what an extreme crisis state due to a CTE entails. Hurricane Andrew ransacked the Florida peninsula in late August of 1992 leaving many (an estimated 200,000) homeless and pensive about their previously "safe" world. Shelby and Tredinnick (1995) assisted the American Red Cross (ARC) in relief services as part of the ARC Disaster Mental Health Services Team. They noted many important phenomena in the wake of Hurricane Andrew. Overall, they observed a feeling of perceived powerlessness among survivors (Shelby & Treddinick), which is common to the crisis state and to the later stages of Baumeister's (1990) escape theory of suicide. It had the characteristics of a negative event which might ultimately have led to hopelessness depending upon its interpretation as proposed by Abramson, Metalsky, et al. (1989). Shelby and Tredinnick note that among adults, there was a clear distinction between those who saw the crisis as a learning experience and opportunity for growth and those who saw Andrew as a "last straw on the proverbial camel's back" thrusting them into a state of hopelessness and despair.

Because of the intensity and gravity of these possible outcomes, it is important to examine how these CTEs are handled in the communities where they occur. Of specific interest are post-traumatic stress disorder and media coverage. The National Comorbidity Survey Report shows that the prevalence of PTSD in the general population is approximately 7.8% (National Center for Post-Traumatic Stress Disorder [NCPTSD], 2003a). Focusing on children and adolescents,

studies indicate that 15 to 43% of girls and 14 to 43% of boys have experienced at least one traumatic event in their lifetime. Of those children and adolescents who have experienced a trauma, 3 to 15% of girls and 1 to 6% of boys could be diagnosed with PTSD (NCPTSD, 2003b, ¶ 3).

Studies of at-risk children and adolescents indicate a much higher prevalence: “77% of children exposed to a school shooting, and 35% of urban youth exposed to community violence develop PTSD” (NCPTSD, 2003b, ¶ 4). Additionally, based on reviews of existing research, Haizlip and Corder (1996) report that up to 50% of children living in areas affected by natural disasters have post-traumatic stress symptoms lasting anywhere from 8 months to over two years after the event.

Studies after the Oklahoma City Bombing shed more light on this issue, specifically on the issue of indirect victimization in CTEs. The Alfred P. Murrah Federal Building in Oklahoma City, Oklahoma exploded on April 19, 1995 as the product of terrorist activity, resulting in the loss of 168 lives (Zinner & Williams, 1999). One study of 3,218 middle and high school students (who were tertiary level survivors) surveyed 7 weeks after the bombing, addressed sensory and TV exposure, initial response, current post-traumatic stress symptoms, worry about safety, functioning, and counseling use. Using stepwise regression for exploratory purposes, the researchers identified certain predictors for high levels of post-traumatic stress symptoms including gender, sensory

exposure, television exposure, and initial reaction to the tragedy. The female students exhibited significantly higher levels of post-traumatic stress symptoms (PTSS) than male students ($t_{2378} = 8.44$; $p < .0001$, $d = 0.34$). The researchers found that 5% of students sought counseling; these were students who had greater sensory exposure, stronger initial reactions, greater post-traumatic stress symptoms, worry about safety, and trouble handling demands. Of the students with a score of 65 or more on the Posttraumatic Stress Symptom Scale, only 15% sought counseling which is consistent with the silent suffering or numbing that is inherent in PTSD (Pfefferbaum, Sconzo, Flynn, & Kearns, 2003). Similar findings are associated with children's exposure to natural disasters (Haizlip & Corder, 1996). As noted previously, this numbing is also present in the later stages of Baumeister's (1990) escape theory of suicide.

This increase in post-traumatic stress symptoms is noted not only among children but also among adults (Pynoos, 1996) and older adults (Phifer, 1990). Particularly, the duration of the CTE, the amount of warning, number of subsequent or preceding CTEs, extent to which one witnesses the CTE (e.g. live television coverage as compared to front-page newspaper coverage coupled with level of survivorship), and the level of destruction (especially for natural community traumatic events) and malice (for human made community traumatic events) contribute to one's risk for post-traumatic stress symptoms (Pynoos). Phifer conducted a study after a flood to gauge the effects on the mental well-being of older adults, primary level survivors, exposed to this natural community traumatic event. Findings indicate that depression and anxiety increased and remained at this increased level up to 18 months after the event. Additionally, Phifer concludes that the effects of natural disasters on an older adult's

psychological well-being is comparable to the effects of bereavement, severe health problems, and financial distress.

Taking a focused look at suicide rates among quaternary level survivors in the midst of community traumatic events, a study after the nationally felt tragedy of President John F. Kennedy's assassination on November 22, 1963 (Biller, 1977), indicated that, though the state of crisis was certainly present due to the extensive media coverage of the shooting, its aftermath, and the funeral, the change in rate of suicide observed was not what one might expect. Biller looked at 17 years of data (1956 to 1972) and compared the number of suicides each year during the period of November 22nd to November 30th. What he found was that the average rate of suicide for those nine days each year was 4.35; but, in the year of 1963, zero suicides occurred during this nine-day period. Biller turned to Durkheim's work, *Le Suicide* (1897/1951/1979), for an explanation. Durkheim posited that when there are CTEs such as war or a national tragedy like the violent striking down of the president, people tend to focus more on the gravity of the issue external to themselves and see that external issue as more profoundly horrid than their own perceived personal crises. Applying Baumeister's (1990) theory, this may be a turning point during which the stage three tunnel vision or concrete thinking ceases. In other words, analyzing the community traumatic event around them, their reasons for wanting to die or escape become miniscule in comparison. Though no comparison tests were performed to examine differences among the years studied, it is important to note here that from 1960 to 1961, the suicides in the nine days studied decreased from five to one and in 1962, there were only two suicides. After JFK's 1963 assassination, in 1964 during the same nine days,

an increase is noted with six suicides occurring. In the subsequent years (1965 to 1972), the suicide rates during the 9 days studied were seven, three, eight, four, nine, six, and eleven respectively. In work with survivors of suicide, it is noted that the anniversaries of the deaths of their loved ones are times of great personal crisis and grief, especially the second year after the death (Fine, 1997) (the second year after JFK's death produced seven suicides among the 29 cities studied). It is possible that the fluctuations in suicide noted during this time each year may be, in part, due to memorializing the brutally murdered president. In fact, anniversary reactions are recognized phenomena among people with PTSD and can include re-experiencing the event, avoidance of things that are associated with the crisis, anxiety, and hypervigilance (Hamblen, Friedman, & Schnurr, 2003).

A similar study was conducted in the aftermath of the death of Princess Diana in 1997 in England and Wales. Hawton et al. (2000) found that during the week following her death, suicides remained at the expected rate based on the rates from the five previous years (1992-1996) for that week. However, Hawton et al., unlike Biller (1977) went on to study the entire month following the Princess' death and found that there was a difference in rates in comparison to rates for the same time period in the previous five years, a 17.4% increase. This increase was found even after controlling for documented seasonal trends previously observed in England and Wales and was found to be higher for women than for men. Among women, the increase was particularly elevated within the Princess' age group (24-44 years of age) and during the fourth week after the funeral.

A more poignant example of a CTE is the set of events of September 11th. On September 11, 2001, the United States of America was violently attacked by terrorists on her shores in New York, Washington DC, and Pennsylvania. A study using a randomized, representative sample revealed that three to five days after the attacks, over 90% of adults across the nation were experiencing at least one post-traumatic stress symptom as were 35% of children. Additionally, it was reported that 47% of children were more vigilant about their safety and the safety of their family. Adult Americans watched an average of eight hours of television coverage (children averaged 3 hours) of the events and individuals' intensity of stress symptoms was positively correlated with the amount of television coverage viewed (Schuster et al., 2001).

After September 11, 2001, a few studies have emerged on the psychological impact of the attacks on children, adolescents, adults and first-responders both in the immediate area where the attacks occurred and across the U.S. However, only two studies emerged looking at the effects of the terrorist attacks on suicide rates. Neither of these was conducted in the U.S. Salib (2003) looked at suicide rates in England and Wales in the month following the attacks and found a decrease in suicide rate for that September in comparison to September rates in previous years; the study did not look for possible anniversary effects in September 2002. deLange and Neeleman (2004) conducted a similar study in the Netherlands but, unlike Salib, deLange and Neeleman looked at the two month period following the event rather than just one month. deLange and Neeleman found evidence of a significant increase in the suicide rate after the terrorist attacks.

As noted, after JFK's assassination and after Princess Diana's death, there were no immediate increases in suicides. Perhaps the experience during Hurricane Andrew can shed some theoretical light on the question of why there were no suicides during times of such tragedy. As Shelby and Tredinnick (1995) point out, there was a qualitatively perceivable and observable increase in social connectedness, thanksgiving for blessings retained (e.g. life, family), and a new perspective (e.g. fleetingness of material wealth). Social connectedness, what Durkheim termed social integration (1897/1951/1979), has long been found to be a protective factor against suicide. Joiner (2004) posits that this has to do with the rallying together and increased belongingness felt during times of community and national crisis.

However, there is another possibility. Turning back to the combination of Baumeister's (1990) and Abramson, Metalsky, et al. (1989) theories, is it not possible that aftereffects of community traumatic events might be insulated or masked for a time by social integration (e.g. the immediate aftermath of Hurricane Andrew)? Eventually, the community or social group would then return to its previous state of integration (or lack of integration for the person trapped in Baumeister's escape cycle). Would returning to this previous state result in the returning to the escape cycle Baumeister proposes by those who are experiencing severe hopelessness and actually exacerbate it? Is it possible that this is the reason for the increased number of suicides in the years following JFK's assassination? The frequency of suicide was already on the decline in years previous to JFK's assassination and then increased relatively dramatically thereafter.

In looking specifically at human-made CTEs such as the Oklahoma City (OKC) bombing of 1995 and the September 11, 2001 (9/11) terrorist attacks, does the nature of the event also have a role? Events like JFK's assassination, though tragic, may not carry the sense of threat and feelings of compromised safety that OKC and especially September 11th elicited. As Padgett (2002) states in an article describing the impact of September 11th on social work research,

The September 11 disaster was a unique event in convergence of several factors. It was **unexpected** (that is, without warning and not during wartime); **sudden; intentional** (that is, neither natural disaster nor a manmade accident such as Chernobyl); **foreboding** (that is, likely to lead to future terrorist attacks of even greater severity involving biological or nuclear weapons); **witnessed by millions; prolonged over several months** and constant in its coverage by the media; and **intensely political** in its impact on national and local governments and on the vast military mobilization that ensued (p. 186-187).

Is it not plausible then that, considering the escape theory of suicide, suicide rates might increase in the weeks, months and years to follow an event like September 11th? Is it not also possible that the likelihood of this might increase when a community is victimized in a series of community traumatic events, adding to the psychache of many residents already in a state of hopelessness due to internal crises?

To illustrate part of this thesis, consider the true cases of Pat and Jon. Pat was a breast cancer survivor, had recently found out she needed a pacemaker, and had suffered from depression for years. Her husband, Joe, worked in the World Trade Center (WTC) when it was bombed in 1993. In 2001, he died in the WTC on September 11th. In addition to the depression and series of crises leading up to Joe's death, afterwards, Pat lost Fu Manchu, her shih tzu. Three months after her husband's death, Pat died by suicide (Mulrine, 2001).

Jon, unlike Pat, was not directly affected by the September 11, 2001 attacks, fitting the third level of survivorship as defined by Zinner (1985). Jon had lived in Manhattan with his mother. His sister describes him as having struggled with depression and hopelessness, often focusing on the disappointments and frustrations in his life. He had held a variety of jobs after college and in early 2001, moved in with his mother. When the events of September 11, 2001 occurred, he joined with others and volunteered with the ARC. Around the same time as Pat suicided, Jon leapt to his death from his mother's balcony (Siwek, 2002). Both Pat and Jon had experienced a series of disappointments and crises in their lives prior to September 11, 2001. Both seem to be almost perfect examples of the escape theory of suicide proposed by Baumeister (1990). Considering their previous experiences, it is likely that the events of September 11, 2001—the loss of a husband for Pat and the first-hand witnessing of so much suffering for Jon—were the last things they could handle.

Jon and Pat are two publicized suicides that seem to have a connection with the CTE of the September 11th, 2001 attacks. Perhaps these are not isolated cases. Perhaps these and other cases occurred when the community resumed a normalcy similar to that of pre-September 11th times; this is supported by a study of psychache (or psychological quality of life) where psychache was found to be associated with suicidality even after depression, hopelessness, and physical quality of life were controlled (Berlim et al., 2003). Perhaps, too, there were a series of subsequent CTEs that stressed the situation. For example, Dave Thomas, the coroner in Monroe County, Pennsylvania where Pat and her husband lived, noted that prior to September 11, 2001, the average was about 20 suicides per year but in the six weeks around the time of

Pat's suicide, there were a total of 14 suicides in the county (Mulrine, 2001).

Anniversaries are important around personal crises as illustrated in the cases of survivors of suicide and people experiencing PTSD (Hamblen et al., 2003); perhaps this is the case with community traumatic events too. As was noted with JFK's death, the nine-day periods following the anniversaries in subsequent years had higher frequencies of suicide than the years preceding the event.

Although numerous researchers have studied suicide and the impact of traumatic events on the mental health of individuals, few have looked at the impact of community traumatic events on the suicide rate. Those that have, including deLange and Neeleman (2004), Hawton et al. (2000) and Salib (2003), focused on one sole event such as the death of Princess Diana and the September 11th terrorist attacks. All admit that this is a limitation to their studies because other co-occurring events may have contributed to the effects of these events of focus.

The primary purpose of this study is to examine the temporal distribution of suicide in a Louisiana parish (county) in the Southern United States over the time period of January 1, 1994 to December 31, 2004 using the escape theory of suicide as a framework and analyzing the suicide rates particularly during the time periods of community traumatic events and anniversaries of community traumatic events experienced by the Louisiana parish (county). This will involve two primary tasks on the part of the researcher: 1) identifying and removing any underlying seasonal patterns inherent to the sample and 2) assessing whether after this removal, there is a relationship between the CTE's sustained by the parish (county) and its rate of suicide.

Research Design

The first element of the research design for this study is the identification and explanation of patterns in the distribution of suicide. This has been a goal of research in the field of suicidology since Morselli (1881) and Durkheim (1897/1951/1970). Theories have been developed and tested such as Baumeister's (1990) escape theory and Stack's (1995) theory of temporal disappointment. Yet, current research such as investigations conducted by Ho et al. (1997) and Yip et al. (1998, 2000) suggest that these long studied temporal patterns are disintegrating. Of interest is examining the various research designs employed in these different studies. Sound replication is vital in the search to confirm if the originally identified temporal distribution patterns are still present in current suicide data and to investigate if these patterns are disturbed when a community experiences a Community Traumatic Event (CTE).

Hakko et al. (2002) undertook the daunting task of reviewing studies of seasonality in the temporal distribution of suicide and identified discrepancies that are attributable to vast inconsistencies in research design. Hakko et al. (2002) reviewed studies published between 1970 through 1997. The purpose of this review was to arrive at a set of criteria for designing future studies of temporal patterns in suicide to be more robust and appropriate to the nature of these studies. From this time period, Hakko et al. identified 46 studies in psychiatric journals which met criteria for inclusion (i.e. focused on seasonality, published between 1970 and 1997, written in English, sample was regional or national in coverage). Hakko et al. chose to begin with 1970 because prior to that, tests of statistical significance in studies of suicide seasonality were often not performed (Lester, 1971). Many of the studies included used either or both homicide

and accidental deaths as comparison groups (Hakko et al., 2002). A few of the studies reviewed by Hakko were included elsewhere in this literature review (Barracough & White, 1978; Eastwood & Peacocke, 1976; Lester, 1971, 1979; Lester & Frank, 1988; Maldonado & Kraus, 1991; Massing & Angermeyer, 1985; Meares et al., 1981; Micciolo et al., 1989; Nayha, 1982).

Employing a logistic regression analysis on a variety of variables including adjustment for calendar effect (i.e. adjusting for different numbers of days per different months using the Julian Calendar), use of chi-square test, use of analysis of variance test (ANOVA), use of nonparametric test, and use of harmonic/spectral analysis, Hakko et al. (2002) investigated “whether a statistically significant result for spring seasonality (yes/no) was dependent on certain characteristics of the data and on statistical methods used in an article” (p. 193). Among their findings, Hakko et al. point out that though the most inappropriate because it does not allow focus on order of the observations, the chi-square test was the most often employed as the statistical technique in tests of seasonality (This was also the method employed by Campbell and Lester [1996] to assess seasonality in the parish [county] of interest in this study). Additionally, the results of the logistic regression analysis indicate that this technique is not likely to detect a statistically significant seasonality. The use of the student’s t-test and ANOVAs are also inappropriate because of the same limitation of not accounting for observation order. An additional limitation of the chi square test, student’s t-test, and ANOVA is that the burden of predetermining the groupings (e.g. weeks, months, seasons) of data rests upon the researcher. These groupings in many cases are artificial in nature. For example, though there are generally accepted dates for the beginnings of the four

seasons, these do not coincide with the onset of seasonal changes in all regions, such as the study parish (county), which has a longer summer season and an almost imperceptible winter; rather, fall and spring seem to be one long season. Finally, patterns identified as existing using daily, weekly, monthly or seasonal groupings draw heavily upon findings of Durkheim, Moriselli and other pioneering researchers who, at the time, did not have the statistical techniques at their disposal that are available to present-day researchers (Lester, 1971).

Due to the limitation of omitted order, Hakko et al. (2000) recommend harmonic analysis for testing seasonality because it allows for focus on the inherent order of observations in this type of research. However, harmonic analysis requires that the researcher have knowledge of the cycles inherent in the data *a priori* (Warner, 1998). Considering that the cycles identified in the literature dating back to Morselli (1881) and Durkheim (1897/1951/1970) were arrived upon using insufficient statistical testing which did not take into account the ordered nature of the observations, harmonic analysis is not as appropriate as spectral analysis. Spectral analysis not only takes into account the observation order but also does not require *a priori* knowledge of cycling in the data (Warner, 1998). The logistic regression analysis Hakko et al. (2000) conducted supports that spectral analysis is most appropriate for identifying seasonal cycles in the temporal distribution of suicide. Given previous inconsistencies and use of inappropriate statistical techniques (e.g. chi-square test, t-test, ANOVA) in previous studies of seasonality, it is logical to use previous research at most for hypotheses but not as established and proven patterns of variability.

In addition to testing for seasonality in the overall sample, many of the research studies included in Hakko et al. (2002) analysis focused on seasonality among subgroups (e.g. gender, ethnicity). Some of the studies did not use tests of significance at all for these sub-analyses; of those researchers who did test for significance, the majority used Pearson's or Spearman's tests for correlation. Because these focus only on the strength of a relationship rather than a cause-effect relationship, Hakko et al. recommend the use of a cross-correlation which is typically paired with time-series analyses.

In summary, Hakko et al. (2002) recommend the following criteria or inclusions for studies of temporal distributions of suicide:

- Adjustment for the "Calendar Effect"
- Graphical Presentations
- Time Series Techniques for Data Analysis
- Adequate length of the time series to be studied.

Additionally, Warner (1998) and Yaffee (2000), in their comprehensive books on conducting spectral analyses, both suggest a minimum of 50 observations.

The second component of the research design for this study is the investigation of the effects of community traumatic events (CTEs) on the temporal distribution of suicide. Once spectral analysis is used to identify and remove underlying seasonality inherent to the sample, analyses of the relationships, if any, between the CTEs and the distribution of suicide are feasible. Among the studies to date identified in this literature review investigating the effects of CTEs on the distribution of suicide (e.g. Biller, 1977; deLange & Neeleman, 2004; Hawton et al., 2000; Jobes, et al., 1996; Salib, 2003) the

research designs differ considerably. The studies and the designs employed in each are presented in Table 4. This information, along with the recommendations offered by Hakko et al. (2000) will be used to inform the design of this study.

Table 4

Characteristics of Selected Previous Studies of the Effects of Community Traumatic Events (CTEs) on the Temporal Distribution of Suicide

Authors/ Year	CTE	Study Sample	Length of Study	Method of Control for Seasonality	Statistical Tests	Relevant Author Identified Limitations
Biller (1977)	Assassination of President John F. Kennedy (November 22, 1963)	29 of 61 randomly selected cities in the U.S.	November 22-30, 1956 through 1972	None	z score	None
Jobes et al. (1996)	Suicide of Kurt Cobain (April 5, 1994)	Suicides in King County, Seattle (Calls to Local Crisis Center were also studied)	7 week period following suicide, 1993-1995	None	Quasi-interrupted time series	None
Hawton et al. (2000)	Death of Princess Diana (August 31, 1997)	Suicides in England and Wales (Deliberate Self-Harm incidences were also studied)	June 1- November 30, 1992 through 1997	6 month periods from 1992 to 1996 used as a comparison for the 6 months studied in 1997	Poisson Regression	"...impossible entirely to rule out chance fluctuations or other influences which might explain the findings" (p. 465).

(Table continued)

Salib (2003)	Terrorist Attacks in New York, Washington DC and Pennsylvania (September 11, 2001)	Suicides and homicides in England and Wales (Undetermined injury deaths were also studied)	12 week period before and after September 11, 1999-2001	Periods from 1999 and 2000 used as a comparison for the 2001	Goodness of fit χ^2 test	"It is impossible to rule out entirely the effect of chance fluctuations or other influences that might explain the findings" (p. 212)
deLange & Neeleman (2004)	Terrorist Attacks in New York, Washington DC and Pennsylvania (September 11, 2001)	Suicides in the Netherlands (Deliberate Self-Harm incidences were also studied)	1997-2001	Dummy variables introduced for winter, spring, summer, late summer and autumn	Ordinary least squares regression with Durbin-Watson statistic used to assess for autocorrelation; Cochrane-Orcutt procedure used to adjust for autocorrelations	Needs replication with more years post-September 11, 2001; co-occurring CTEs not included in analysis;

CHAPTER THREE

METHODOLOGY

The primary purpose of this study was to determine if a relationship exists between community traumatic events (CTE) such as the September 11, 2001 terrorist attacks and the temporal distribution of suicide in a Louisiana parish (county) in the Southern United States over the time period of January 1, 1994 to December 31, 2004. This study was designed as an ex post facto correlational exploratory study. Approval to conduct this study was obtained from the Louisiana State University Institutional Review Board (#2950, Appendix A).

Sample

There were two samples used in this study. One consisted of people who died by suicide in the selected Louisiana parish (county) from January 1, 1994 to December 31, 2004 whose deaths were investigated by the parish (county) coroner. Comparison groups for this sample consisted of people who died between January 1, 1994 and December 31, 2004 in the selected parish (county) either by homicide or accident and whose deaths were investigated by the parish (county) coroner. The second sample was of calls received by the American Association of Suicidology (AAS) certified crisis hotline in the selected parish during the time period of January 1, 1994 to December 31, 2004.

The 2000 U.S. Census estimates the selected parish (county) population to be 412,852, a 32,747 increase (9%) over the 1990 U.S. Census. Males accounted for 47.9% of the parish's (county's) population and females comprised the remaining 52.1%. Race was categorized into White, Black or African American, American Indian or

Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, “Some other race”, and “Two or more races”. The U.S. Census Bureau does not categorize “Hispanic or Latino” as a race but rather an additional category or ethnicity that could include any number of combinations of races with 1.8% ($n = 7,363$) of the selected parish (County) residents self-identifying as Hispanic or Latino (U.S. Census Bureau, 2004). The distribution of races is illustrated in Table 5.

Table 5
Racial Distribution of the Study Parish’s (County’s) Residents ^a

Race	n	%
White	231886	56.2
Black or African American	165526	40.1
American Indian or Alaska Native	850	0.2
Asian	8585	2.1
Native Hawaiian or Other Pacific Islander	121	<0.1
Some Other Race	2031	0.5
Two or More Races	3853	0.9
Total	412852	100.0

^a Based on the U.S. 2000 Census

Instrumentation and Data Collection

The coroner’s office for the selected parish (county) is the responsible entity for investigating all reported suicides, homicides, and accidental deaths in the parish (county). The researcher obtained permission from the coroner’s office to collect data on deaths investigated between the years 1994 and 2004. A researcher designed recording form was created and used to collect data for the sample of deaths

investigated by the parish's (county's) coroner's office during the selected period. This recording form was designed as a computer based spreadsheet into which the relevant variables of investigation were downloaded. The objectives of the study served as the basis for selection of items to include in the instrument. The recording form was validated by the coroner in office at the time. The form, created in Microsoft Excel, was designed to download the variables of identification number, reported age of deceased, gender of deceased, race of deceased, date of death, method of death, and type of death for suicides, homicides, and accidents from January 1, 1994 to December 31, 2004 from the coroner's database. Of these deaths recorded ($n = 2,506$), 17 cases were removed because one or more of the variables of interest were missing. An additional 90 deaths under the age of 5 were removed from the comparison groups of deaths due to homicide ($n = 36$) and accidents ($n = 54$) because suicidologists agree that a person under the age of 5 is not cognitively capable of taking his or her own life with full intent and understanding. A total of 2,399 deaths were included for analysis with 442 suicides (18.4%), 809 homicides (33.7%), and 1,148 accidents (47.9%).

An additional variable, date of birth, was requested from the selected parish's (county's) coroner's office during the initial meeting in 2003 for two reasons: to have a more accurate age of the victim and to be able to identify if the suicide occurred on or close to the victim's birth date. At the time of the initial meeting with the coroner, date of birth for suicide victims was released from January 1, 1994 through September 23, 2003. Dates of birth for the comparison groups of homicide and accidental death victims were not released. The coroner agreed that dates of death for suicide victims was important for identifying the possibility that significance of the birthday or age may have

been a contributing factor but did not concur that the birthdates were needed for comparison groups. The remainder of the birthdates for victims dying by suicide between September 24, 2003 and December 31, 2004 was requested in early 2005. By 2005, a new coroner had been elected and permission was not granted to obtain the birth dates for victims of suicide from September 24, 2003 through December 31, 2004.

For the sample of calls made to the AAS certified crisis hotline serving the parish (county), the executive director of the crisis intervention center managing the hotline authorized the use of call data on calls answered by the hotline during the 11 year period of investigation. In retrieving this data, it emerged that the crisis center would only be able to provide data for 1996 through 2004. Records prior to 1996 were destroyed as the center was no longer required to keep records prior to that time (G. Bourgeois, personal communication, July 25, 2005). Additionally, the certifying body's policies and procedures do not require that records be maintained for any specific length of time (L. Judy, personal communication, July 18, 2005). A separate recording form in Microsoft Excel was created by the researcher including the variables: age of caller, gender of caller, race of caller, date of call, and type of call.

Community traumatic events (CTE) experienced by residents of the selected parish (county), both natural and human made, were identified for the 11 year period of interest. These CTEs were identified by initial date of announcement to the parish (county) through the major local newspaper. A recording form was developed by the researcher to identify initial date of announcement, whether the CTE was a suicide, assisted suicide, human-made or natural-made event and whether the CTE was local, state, regional, national or international in breadth of impact. The content of this

recording form was validated by the co-chairs of this doctoral dissertation committee. For identification and classification decisions about CTEs, a decision flowchart was developed and content validity was established by the researcher and the dissertation co-chairs. Inter-rater reliability was established between the researcher and a co-chair at a level of 97%.

Data Analysis

The data collected for this study were statistically analyzed as described below, organized by research objectives. For all inferential statistical tests, the alpha level of .05 was set *a priori*. Statistical analyses were conducted using the SPSS Package, version 13.0 with the Trends add-on.

Objective 1

Describe individuals who died by suicide in a metropolitan Louisiana parish (county) from January 1, 1994 to December 31, 2004 on the selected characteristics of:

- a. Age
- b. Gender
- c. Race
- d. Method of death
- e. Date of birth
- f. Date of death

For comparison groups, people who died by homicide and accident during the time period are described on the same characteristics with the exception of date of birth. Additionally, calls to the area's American Association of Suicidology certified crisis

intervention center's 24-hour crisis hotline between January 1, 1996 and December 31, 2004 were described on the selected characteristics of:

- a. Age of caller
- b. Gender of caller
- c. Race of caller
- d. Type of call
- e. Date of call

This first objective was descriptive in nature and was analyzed using descriptive statistics. Transformations were required for a few of the variables in both samples and are discussed individually in this section.

Death Data

a. Age of the Deceased

For this variable, age is defined as that which is recorded on death certificates, typically based on ages given by family members or other sources available to the coroner at the time of investigation. To illustrate a clear picture of the distribution of deaths along the age continuum, this interval variable of age as reported on death certificates was organized into the following ordinal categories by the researcher:

- i. 5-14 years old
- ii. 15-24 years old
- iii. 25-34 years old
- iv. 35-44 years old
- v. 45-54 years old
- vi. 55 to 64 years old

- vii. 65 to 74 years old
- viii. 75 to 84 years old
- ix. 85 years and older

These categories are those used to report suicides by the American Association of Suicidology (McIntosh, 1998). Though the comparison groups contained victims under five years of age, these were excluded from the analysis as the consensus among suicidologists is that children under the age of five cannot cognitively understand the finality of suicide, eliminating the necessity of a group of subjects for comparison in this age category, “0-4 years old”. This exclusion eliminated a total of 90 deaths (36 homicides and 54 accidental deaths).

b. Gender of the Deceased

No transformations were required for this nominal dichotomous variable.

c. Race of the Deceased

Regarding race, the selected parish’s (county’s) coroner’s office organizes race across the categories “White”, “Black”, “Hispanic/Latino”, “Asian/Oriental”, and “Other”. In each of the types of death studied (i.e. suicide, homicide, accident), the designations “Hispanic/Latino” and “Asian/Oriental” accounted for less than 1% of cases. For this reason, these categories were combined with the “Other” designation.

d. Method of Death

For data analysis purposes, the selected parish’s (county’s) coroner’s office original “method of death” categories were condensed. Appendix B illustrates the transformation of this variable.

e. Deceased's Date of Birth

The ordinal variable date of birth was not used to calculate an accurate age for suicide victims given the incomplete nature of the data set. However, for the suicides between January 1, 1994 and September 23, 2003, the dates of birth still served the purpose of identifying victims who suicided temporally close to their birth dates and were used for this purpose.

f. Date of Death

For this objective, dates of death were condensed to the ordinal category "year of death" to facilitate reporting. However, the exact dates of death were used in the remainder of the study.

Calls to the Local Crisis Intervention Center Hotline

A total of 149,737 calls were answered during the time period studied, January 1, 1996 through December 31, 2004. Thirteen of these calls were not included in the analysis due to missing variables of interest. Of the remaining 149,724 calls, 71,738 calls were not included in the analysis. These calls were not included for one of four possible reasons:

a. "Validity Questioned" Calls

The hotline often receives "prank" calls and these are recorded in the call database. These calls were not included in the analysis.

b. "Consistent Callers"

The hotline serves as a resource for people with chronic mental illnesses. These callers typically have the crisis center hotline as part of their treatment plan and have a case file at the crisis center to guide phone counselors in their interactions with these

callers. These calls were not included in the analysis due to the chronic nature of these callers' diagnoses which would unnecessarily inflate findings of stress, trauma, and crisis in the general population.

c. "Prematurely Ended" Calls

Often, a phone counselor will be on one call when a second call is received. These calls are answered and the caller is asked to leave a number so the counselor can return the call or the caller is asked to call back. These prematurely curtailed calls were not included in the analysis nor were calls where the caller prematurely ends the call.

d. "Check-In" Calls

The hotline serves as a communication hub for on-call mental health practitioners around the state and for crisis hotline counselors. These calls are recorded in the call database and were not included in the analysis as these are routine calls rather than crisis calls.

Once these calls were removed from the 149,737 original calls database, a total of 77,986 calls remained for inclusion in the analysis. In this subset of calls, there were five days (i.e. 12/17/1999, 3/10/2000, 6/3/2000, 6/4/2000, and 6/5/2000) with no calls once the previously mentioned calls were removed. Transformations or acknowledgements that were necessary for proceeding with the study are described below.

a. Age of Caller

Though the variable "age of caller" was included in the database of calls, these were not included in the analysis for this study for two reasons: callers may have given

a fictitious age and counselors often estimated age or recorded age in a range (e.g. late 40s, 50-60 years old).

b. Gender of Caller

The variable “gender of caller” was included in the database of calls and in the analysis of this objective. However, the reader is cautioned that this data may be inaccurate for two reasons: callers may have given a fictitious gender and counselors often presumed gender based on tone of voice, name (which may have been a pseudonym), and content of the call.

c. Race of Caller

The variable “race of caller” was included in the database of calls but were not included in the analysis for this study for two reasons: callers may have given a fictitious race and counselors often presumed race based on tone of voice, name (which may have been a pseudonym), colloquialisms, and content of call.

d. Type of Call

The crisis center providing the call data had over 130 unique codes for the variable “type of call”. Additionally, the crisis center’s policy is to identify both a “primary type of call” and a “secondary type of call” for each call received. Due to the nature of this study, this level of specificity was not necessary. These 130 plus codes were collapsed into the following four categories: “Crisis”, “Non-Crisis”, “Suicide-Related”, and “Information Requested” (A full illustration of the code condensation is available in Appendix C). Additionally, in the transformation of this variable, the “primary type of call” code was used for the majority of observations. However, for calls coded as “exhibitionism”, “dating”, and “masturbation”, the “secondary type of call” code was used

because there was an almost equal chance that the call could be of a crisis, non-crisis, or information nature.

e. Date of Call

For this objective, dates of calls were condensed to the ordinal category “year of call” to facilitate reporting.

Objective 2

Describe and compare the temporal distribution of suicides in a metropolitan Louisiana parish (county) from January 1, 1994 to December 31, 2004 with the temporal distributions of homicides and accidental deaths during the same period, exploring for trends on the variables day of the week of death, week of the month of death, and month of the year of death. Additionally, describe the distribution of calls to the local crisis center hotline on the variables of day of the week, week of the month, and month of the year.

This objective included multiple aspects. First, an aim was to describe the temporal distribution of suicides, homicides, and accidental deaths in the selected parish (county) from January 1, 1994 to December 31, 2004. To achieve this objective, the distributions were described on the ordinal variables: day of the week of death, week of the month of death, and month of the year of death. The process for describing each of these variables of study is detailed in this section.

Death Data

a. Day of the Week of Death

For the calculation of frequencies for this variable, weeks were considered to begin on Monday as in previous studies (e.g. Stack, 1995). The calendar effect, unequal

number of days per month, was not adjusted (i.e. using the Julian calendar) for this objective as it was for the remainder of the study. Because this study uses Baumeister's (1990) theory of suicide as escape, the exact occurrences of weekends are vital and must remain intact. Adjusting for the calendar effect in this objective would overlook exact occurrences of weekends.

b. Week of the Month of Death

For the calculation of frequencies for "week of the month of death", weeks were considered to begin on Monday as in previous studies (e.g. Stack, 1995) with two exceptions. The first and last week of each month was considered to begin on whichever day the month began or ended (e.g. a month where the 1st was a Friday would have the first week of the month beginning that Friday). The calendar effect, unequal number of days per month, was not adjusted (i.e. using the Julian calendar) for this objective as it was for the remainder of the study. Because this study uses Baumeister's (1990) theory of suicide as escape as the conceptual framework, the exact occurrences of beginnings and ends of months are vital and must remain intact. Adjusting for the calendar effect in this objective would overlook exact occurrences of beginnings and ends of weeks of the month.

c. Month of the Year of Death

For the calculation of frequencies for this variable, the calendar effect, unequal number of days per month, was not adjusted (i.e. using the Julian calendar) for this objective as it was for the remainder of the study. Because this study uses Baumeister's (1990) theory of suicide as escape, the exact occurrences of beginnings and ends of months are vital and must remain intact. Adjusting for the calendar effect in this

objective would overlook exact occurrences of beginnings and ends of months of the year.

Calls to the Local Crisis Intervention Center Hotline

a. Day of the Week of Call

For the calculation of frequencies for this variable, weeks were considered to begin on Monday. The calendar effect, unequal number of days per month, was not adjusted (i.e. using the Julian calendar) for this objective as it was for the remainder of the study. Because this study uses Baumeister's (1990) theory of suicide as escape, the exact occurrences of weekends is vital and must remain intact. Adjusting for the calendar effect in this objective would overlook exact occurrences of weekends.

b. Week of the Month of Call

For the calculation of frequencies for "week of the month of call", weeks were considered to begin on Monday with two exceptions. The first and last week of each month was considered to begin on whichever day the month began or ended (e.g. a month where the 1st was a Friday would have the first week of the month beginning that Friday). The calendar effect, unequal number of days per month, was not adjusted (i.e. using the Julian calendar) for this objective as it was for the remainder of the study. Because this study uses Baumeister's (1990) theory of suicide as escape, the exact occurrences of beginnings and ends of months are vital and must remain intact. Adjusting for the calendar effect in this objective would overlook exact occurrences of beginnings and ends of weeks of the month.

c. Month of the Year of Call

For the calculation of frequencies for this variable, the calendar effect, unequal number of days per month, was not adjusted (i.e. using the Julian calendar) for this objective as it was for the remainder of the study. Because this study uses Baumeister's (1990) theory of suicide as escape, the exact occurrences of beginnings and ends of months are vital and must remain intact. Adjusting for the calendar effect in this objective would overlook exact occurrences of beginnings and ends of months of the year.

Objective 3

Describe the community traumatic events (CTEs) and publicized suicides and assisted suicides experienced by a metropolitan Louisiana parish (county) community during the period of January 1, 1993 to December 31, 2004 on the level of impact defined as local, regional, national, or international and on the categories of natural, human-made, or suicide.

This second objective was descriptive in nature. Though the sample of deaths covers January 1, 1994 through December 31, 2004, for this objective, January 1, 1993 through December 31, 1993 was added for one main reason. It is noted in the literature that anniversaries of suicides (e.g. Fine, 1997), and likely community traumatic events (CTEs), are times of renewed anguish for survivors. Given that deaths and calls to the crisis hotline occurring in 1994 may have a link to anniversaries of CTEs in 1993, this year was added to the sample of community traumatic events to have a more accurate calculation for this aspect of the study, capturing possible anniversary effects within the death and call data from CTEs occurring from 1993 through 2003.

Frequencies and percentages were used to describe community traumatic events (CTE) experienced by the selected parish (county) community. These CTEs were categorized using the ordinal categories of local, state, regional, national, or international to define breadth of impact and were also categorized nominally based on whether the CTE was a natural-made event, human-made event, or a suicide.

The researcher identified CTEs using a set of criteria she developed (Figure 3) based on Zinner's (1985) classification of survivorship. Zinner designed a four-level classification system as follows: (1) primary level: those who had intimate relationships with the people who lost their lives in the traumatic event, whether family, friends or other significant relationships; (2) secondary level: those who knew the deceased victims through activities such as work; (3) tertiary survivors: those who share a social or geographic characteristic with the deceased such as being of the same occupation or race or living in the same community or state; and (4) quaternary survivors may share the same nationality or other broadly defined characteristic. While Zinner's (1985) levels of survivorship focus on the relationship to a deceased person or persons, the CTE criteria developed for this study focus on a more detailed examination of Zinner's tertiary and quaternary levels of survivorship.

The principal criterion was that the event be covered on the front page of the sole newspaper serving the selected parish (county). Suicides reported on the front page were automatically recorded as a CTE of local level impact given the Werther Effect phenomenon (Phillips & Lesyna, 1995). Similarly, because Frei et al. (2003) identified the Werther Effect as applying to assisted suicides, these were also automatically recorded as CTEs of local impact in the "suicide" category. Once the criterion of non-

suicide, front page coverage was met, others were employed based on breadth of impact. For events which occurred within the selected parish, to be classified as a CTE, the event needed to meet the criteria of being traumatic (e.g. involving loss of or threat thereof) and out of the ordinary. For example, many communities sustain homicides and accidental deaths on an almost daily basis; yet serial killings, serial rapes, accidents claiming numerous lives, (e.g. explosion, overturned school bus) and natural disasters (e.g. hurricanes, floods) are not usual, daily occurrences. Natural disasters not directly affecting the selected parish (county) were not included as CTEs because it is cited in the literature that natural disasters do not have as deep an impact on people's emotional states as do human-made CTEs (James & Gilliland, 2001). For this reason, the process for identifying whether a naturally occurring event is a CTE follows a different order than the similar process for identifying whether human-made events are CTEs. State, regional, national and international events were considered CTEs if the event was traumatic, out of the ordinary, and likely to affect parish (county) residents physically, emotionally or mentally.

There are two main decision points in this process, namely what would be considered out of the ordinary for the selected parish (county) and what would affect residents physically, emotionally, or mentally, which require firsthand knowledge of the parish (county). The researcher has lived in the state of Louisiana for over 22 years. Thirteen of those years, she resided in a rural area in a parish (county) adjacent to the selected parish (county), obtaining many of her major services in the selected parish (county). For the past five years, she has resided in the selected parish (county) and has been actively involved in the community, enlightening her in the two decision points

of this process requiring knowledge of the selected parish (county). The process of identifying CTEs in its entirety is most clearly explained in Figure 3.

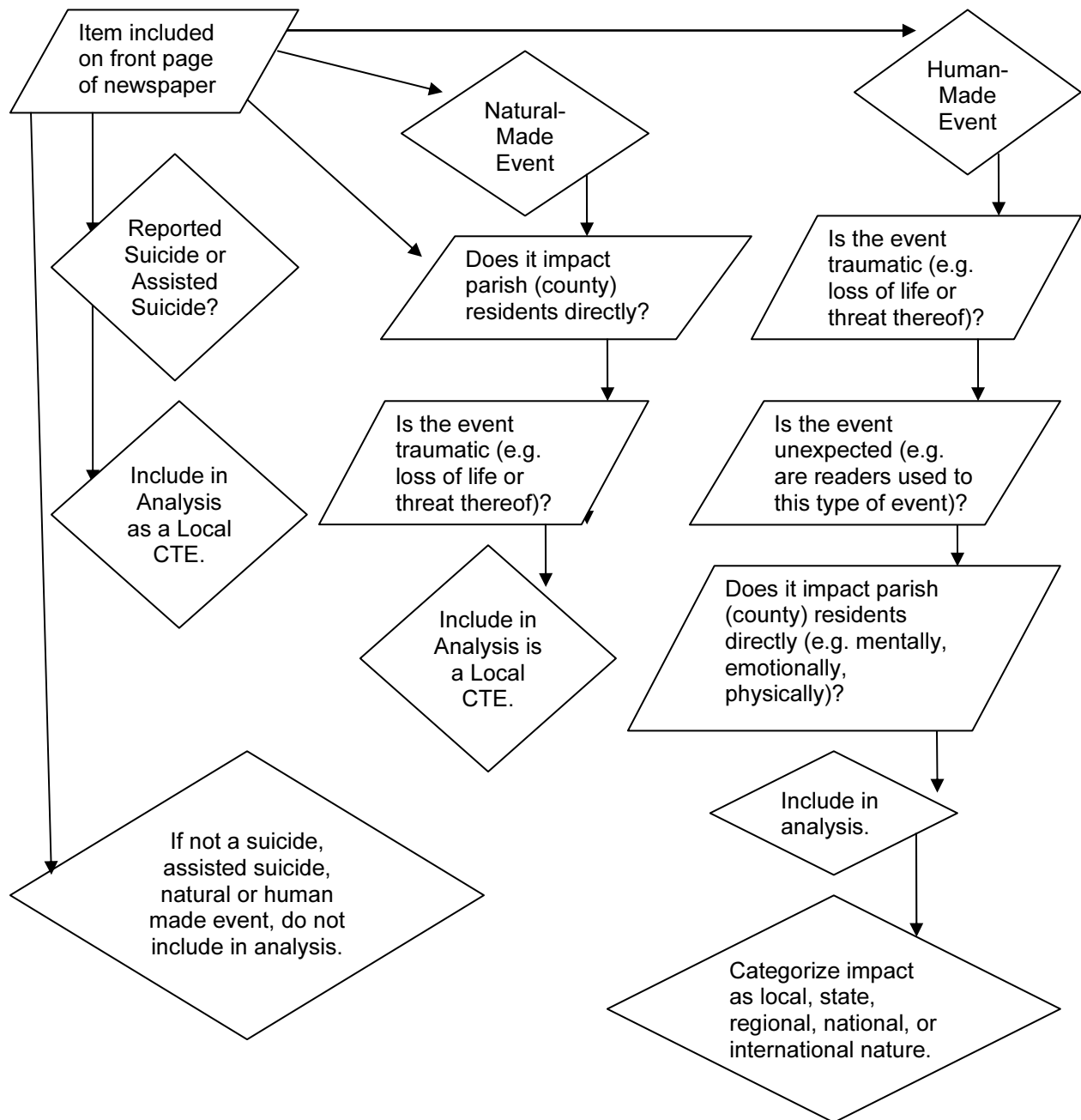


Figure 3. Flowchart for Identifying Community Traumatic Events (CTEs).

Once identified, the CTEs were entered into a researcher designed database. The data were organized to be time-based with each 24-hour day being one observation. Within this format, the researcher defined this variable as ratio data. Days where there were no CTEs were given a “0” value indicating an absence of the phenomenon, which is the absolute “0” point necessary for ratio data.

Objective 4

Determine the length of the effect of a community traumatic event on a community after the initial announcement of the event as measured by changes in the temporal distribution of suicide and changes in the volume of suicide-related calls to the local crisis hotline.

The purpose of this objective was to determine how long the effects of a CTE are experienced by a community as measured by the distribution of suicide in the aftermath of these CTEs and the change in call volume answered by the local crisis hotline. In previous research, different procedures were used for examining the after-effects of a CTE. In Biller's (1977) study of the aftermath of President John F. Kennedy's assassination (which only focused on suicide rates), the eight-day period immediately following the event was investigated. Comparison years before and after the year of the event were also investigated on the same eight days. In Phillips and Lesyna's (1995) work investigating suicide rates after extensive media coverage of a suicide, a 10-day period following the suicide was investigated. Jobes et al. (1996) studied changes in call distribution after the highly publicized suicide of Kurt Cobain and used the six weeks before, week of, and five weeks after the suicide as the time period investigated. However, Hakko et al. note that these studies were not conducted using the appropriate

statistical tests (i.e. harmonic or spectral analysis). Because of this, the researcher did not specify *a priori* the time periods within the time series of study for measuring aftereffects of CTEs but, rather, chose to conduct a spectral analysis to identify the periods to be used.

To analyze time-series data, a researcher may choose either harmonic or spectral analysis. For harmonic analysis, the researcher applies patterns or cycles identified in previous research to his or her time-series. Though researchers such as Stack (1995) and Phillips and Ryan (2000) have identified trends associated with holidays, days of the week, weeks of the month, months of the year, and seasons, these findings were not used for one reason. As Hakko et al. (2002) emphasize, these and other researchers identifying trends in the temporal distribution have not used sufficient or appropriate techniques, thus reducing the internal validity of the research (Campbell & Stanley, 1963) making harmonic analysis inappropriate for this study. Spectral analysis was identified instead as the appropriate method for analyzing the time series. This allows the researcher to assess the entire series (i.e. January 1, 1994 through December 31, 2004) without prior knowledge of trends, patterns or cycles (Warner, 1998).

To achieve this objective, several steps were required of the researcher including reorganization of the data and testing of assumptions necessary for conducting spectral analysis. The length of the time series used was 11 years, January 1, 1994 through December 31, 2004. The sampling frequency, or time interval for each observation, was the 24-hour day. Though time series research can be conducted as either time-based or event-based (Warner, 1998), this study was designed to be time-based. The death data,

in the original form from the coroner, was designed as event-based. Each individual death was recorded as an observation, making the sampling frequency each death rather than each 24-hour day in the 11 year series. The data were reorganized to be time-based with each 24-hour day being one observation. Within this reorganization, the researcher defined suicides, homicides and accidental deaths as ratio data. Days where there were no suicides were given a “0” value for the suicide variable indicating an absence of the phenomenon, which is the absolute “0” point necessary for ratio data. Days with one suicide were assigned a “1”, two suicides a “2”, and so on. Homicides and accidental deaths were coded the same manner. An adjustment for the calendar effect (unequal numbers of days in different months) was constructed by converting the eleven year period of interest into the Julian calendar.

Once the data were reorganized and the calendar effect adjusted, the researcher proceeded with preliminary assessment of the data prior to time series analysis as recommended by Warner (1998). The first requirement met in this study was sufficient sample size. Warner (1998) and Yaffee (2000) recommend a minimum of 50 observations. This data set contained 4,018 observations. The next steps in preliminary assessment of the data included checking assumptions necessary for time series analyses. These included normality, detection and removal of influential outliers, identification and removal of trends (due to dependence of observations [autocorrelation between adjacent observations]), and stationarity of the time series (are the means, variances, and lagged autocorrelations consistent over time?) (Warner, 1998).

To assess normality, the researcher utilized histograms of each of the three death distributions (i.e. suicide, homicide, accidental death), and measures of skewness

and kurtosis calculated in SPSS version 13.0. Scatterplots were constructed of the three distributions for a visual of possible outliers in the datasets. Prior to further analyses of outliers, it was necessary to check for trends in the data.

These trends were assessed using the lagged autocorrelation function in the SPSS 13.0 Trends add-on program. The purpose of lagged autocorrelation is to assess whether there are correlations between sequential observations in the datasets. These correlations, if present and statistically significant, result in trends in the data which would interfere with the detection of cycles in the dataset. The null hypothesis for these autocorrelations was that there was no inherent trend present in the individual datasets (i.e. due to dependence of observations, a.k.a. autocorrelation) or that the distributions consisted of “white noise”. The lagged autocorrelation correlates an observation at time t (X_t) with the observation seen at k observations earlier (X_{t-k}). It is customary to determine the number of lags to compute based on the formula $N/4$ with N being sample size (Warner, 1998). For this study, $N/4$ indicates 1,004 lags ($n = 4018$). SPSS 13.0 Trends allows for no more than 100 lags. This is because the Trends add-on utilizes the Box-Ljung Q Test of significance in the lagged autocorrelation function. Instead of assessing the autocorrelation of each of the 4,018 observations lagged 1,004 times, the Box-Ljung Q Test computes the significance of sets of lagged autocorrelations. If the Box-Ljung Q Test is significant, it is an alert to the researcher that there is likely a trend within the data to be removed prior to performing a spectral analysis (i.e. the null hypothesis of white noise can be rejected) (Warner, 1998).

When lagged autocorrelations are constructed in SPSS 13.0 Trends, a graph of where the autocorrelations fall in a 95% confidence interval is provided along with the

values of the autocorrelations and the corresponding values for the Box-Ljung Q Test and the significance of each set of lagged autocorrelations. If the majority of the datapoints are within the 95% confidence interval, the data consists of white noise (even with pure white noise, 5% of datapoints will fall outside of the confidence interval) (Warner, 1998). Autocorrelations significant at the first couple of lags alert the researcher to a trend to be described and removed (Warner, 1998).

Significant autocorrelations were present in the suicide and accidental death distributions. For this reason, further analyses were conducted to better describe and remove the trend indicated by these results. This required the researcher to identify and remove trends using one of two possible methods: Ordinary Least Squares Regression (OLS) or differencing prior to proceeding with the analysis. OLS was chosen as the trend removal method for this study as differencing is often problematic with certain types of research, often resulting in overcorrection of trends in the data (Warner, 1998), compromising the internal validity of the study (Campbell & Stanley, 1963).

For this simple regression, the necessary assumptions of normality, linearity, average error (distribution of error terms approaches normality), independence of error terms, and homoscedasticity were assessed. Previous tests for normality were referred to for meeting the assumption of normality for OLS. The possible outliers detected in previously created scatterplots resulted in the researcher's use of certain diagnostic tests. Standardized residuals were computed for each distribution and points with residuals exceeding the absolute value of two were further analyzed for influence (h) and leverage (Cook's D). To assess influence and leverage of these points, the researcher used the formula $h > 2(k+1)/n$ with k representing the number of

independent variables (1) and n representing the sample size (4018) for influence and an absolute value of one as the parameter for Cook's D for leverage. No possible outliers exerted sufficient leverage (requiring an h value greater than $2(k+1)/n$) nor influence (a Cook's D value greater than the absolute value of one). Consequently, no outliers were deleted.

The researcher proceeded with the simple regressions using the observation number (i.e. the Julian Calendar observation date) as the independent variable and the type of death as the dependent variable as recommended by Warner (1998) for this aspect of preliminary examination of the data prior to spectral analysis. These regressions were performed on suicides and accidental deaths due to the results of the lagged autocorrelation function but not on homicides as the lagged autocorrelation function was not significant at any of the 16 lags indicating the presence of white noise only. Davis' (1971) descriptors of association were used as a guide in interpreting Pearson correlations constructed as part of these regressions (.00-.09 = negligible, .10-.29 = low, .30-.49 = moderate, .50-.69 = substantial, .70 and higher = very strong). The omnibus tests for these regressions were checked for significance and neither supported the regression line generated being useful for prediction. However, Warner (1998) notes that if autocorrelation exists within the residuals, the omnibus test is invalid. Thus, the researcher conducted lagged autocorrelations (with 16 lags) of the standardized residuals generated from each of the simple regressions. The residuals for suicides were independent of each other, supporting that the omnibus test was valid and that the line generated from the OLS was not useful in predicting suicides. This was not the case for accidental deaths which did have autocorrelated or dependent

residuals. However, given the practical interpretation of the trend being assessed for accidental deaths (an R^2 accounting for less than a tenth of one percent of the variance), the researcher decided to not continue further with the removal process.

The final assumption to be tested prior to proceeding to the spectral analysis in this objective was to check each of the three datasets for stationarity (i.e. consistent means, variances, and lagged correlations over the 11 year time span). Warner (1998) recommends using analysis of variance (ANOVA) as a means of testing stationarity, grouping observations in a manner logical to the dataset organization. In this study, each of the observations is a twenty-four hour period over an 11 year time span resulting in 4,018 observations. To assess stationarity, the observations were grouped by year and one-way ANOVAs were constructed for each of the three distributions. Levene's test for homogeneity of variance was computed. The null hypothesis for this statistic is that the variances in each year's distribution of suicide, homicide, and accidental deaths are homogeneous or stationary. This null hypothesis would be rejected if there were a significance of the Levene Test less the *a priori* .05 significance level of this study. None of the three distributions were found to meet homogeneity of variance ($\underline{E}_{\text{Suicide}} = 3.829 [10, 4007], p < .001$; $\underline{E}_{\text{Homicide}} = 7.977 [10, 4007], p < .001$; $\underline{E}_{\text{Accidental Deaths}} = 9.432 [10, 4007], p < .001$) with the null hypothesis rejected in each of the three types of death.

The heterogeneity of variance in these one-way ANOVAs was sufficient evidence for the researcher to assume violation of the assumption of stationarity necessary for spectral analysis. For this reason, the researcher abandoned the prospect of spectral analysis of the three distributions and proceeded with the study using alternate means.

As an alternate means of achieving this objective, the researcher used the Pearson correlation coefficient to assess the strength of the relationship between CTEs and the distribution of suicide and the comparison distributions of homicide and accidental death if relationships were present. The Pearson correlation coefficient was deemed appropriate by the researcher because both variables are ratio data. A relationship between the CTEs and each of the three respective distributions of deaths was negligible and not statistically significant. If a relationship had existed, the researcher would have continued with a regression analysis. Because this was not the case, the researcher chose to abort additional analyses for this objective as there is no need to determine the length of a negligible effect that was likely due to chance. Considering this, the researcher also abandoned comparisons of call volume in relation to CTEs as well.

Objective 5

Determine if a model exists explaining a significant portion of the variance in per capita suicide rate following community traumatic events from selected societal and personal demographic characteristics. Because a sufficiently significant and sizeable correlation was not identified between the distribution of death and CTEs, this objective was not attempted.

CHAPTER FOUR

RESULTS AND FINDINGS

The primary purpose of this study was to determine if a relationship exists between community traumatic events (CTEs) such as the September 11, 2001 terrorist attacks and the temporal distribution of suicide in a Louisiana parish (county) in the Southern United States over the time period of January 1, 1994 to December 31, 2004. The parish (county) of study is in southeast Louisiana; in this parish (county), deaths by suicide are investigated by the parish's (county's) coroner. The coroner also investigates homicides and accidental deaths; these two groups were identified as comparison groups for this study as in previous research (e.g. Lester, 1979; Stack, 1995). Data on suicides, homicides, and accidental deaths occurring in the selected parish (county) between January 1, 1994 and December 31, 2004 were obtained from the selected parish's (county's) coroner's office which included a total of 2,506 deaths. Call data from the local crisis hotline between January 1, 1996 and December 31, 2004 were acquired and included a total of 149,737 call records. Findings and analyses of relationships are presented in this chapter and are organized by objective.

Objective 1

Objective one was to describe individuals who died by suicide in a metropolitan Louisiana parish (county) from January 1, 1994 to December 31, 2004 on the selected characteristics of:

- a. Age
- b. Gender
- c. Race

- d. Method of death
- e. Date of birth
- f. Date of death

For comparison groups, people who died by homicide and accident during the time period were described on the same characteristics. Additionally, calls to the area's American Association of Suicidology certified crisis intervention center's 24-hour crisis hotline between January 1, 1996 and December 31, 2004 were described on the selected characteristics of gender of caller, type of call, and date of call.

Death Records

Of the deaths recorded between January 1, 1994 and December 31, 2004 ($n = 2,506$), 17 cases were removed because one or more of the variables of interest were missing. An additional 90 deaths under the age of 5 were removed from the comparison groups of deaths due to homicide ($n = 36$) and accidents ($n = 54$) because suicidologists agree that a person under the age of 5 is not cognitively capable of taking his or her own life with full intent. A total of 2,399 deaths were analyzed for this objective with 442 suicides (18.4%), 809 homicides (33.7%), and 1,148 accidents (47.9%).

Age

The first variable used to describe the deaths in this study was the interval variable age as reported on death certificates. The mean age of those who died by suicide was 40.9 years ($SD = 18.5$) with a range of 11 to 92 years. The mean homicide age was 31.4 years ($SD = 12.5$) with a range from 7 to 81 years of age. Victims of accidental deaths included in the analysis ranged in age from 5 to 99 years of age with a mean age of 42.8 and a standard deviation of 23.0 years. Collapsing the interval

variable age into categories used by the American Association of Suicidology, for suicides, “15-24 years old” (\underline{n} = 89, 20.1%), “25-34 years old” (\underline{n} = 98, 22.2%), and “34-45 years old” (\underline{n} = 92, 20.8%) represented the majority of deaths. For the comparison groups of accidental deaths and homicides, these three age categories also contained the majority of deaths. The frequencies for each of these age categories are illustrated in Table 6.

Gender

The second variable of interest for objective one was gender. The majority of residents of the selected parish (county) who suicided during the study period were male (\underline{n} = 348, 78.7%). According to death records, females accounted for 21.3% (\underline{n} = 94) of deaths by suicide. Among homicide victims, males represented 79.7% (\underline{n} = 645)

Table 6
Ages of Victims by Type of Death in Study Parish (County), 1994-2004

Age in Years ^a	<u>Suicide^b</u>		<u>Homicide^c</u>		<u>Accident^d</u>	
	<u>\underline{n}</u>	%	<u>\underline{n}</u>	%	<u>\underline{n}</u>	%
5-14	7	1.6	13	1.6	65	5.7
15-24	89	20.1	288	35.6	249	21.7
25-34	98	22.2	229	28.3	192	16.7
35-44	92	20.8	155	19.2	188	16.4
45-54	51	11.5	84	10.4	121	10.5
55-64	46	10.4	20	2.5	87	7.6
65-74	28	6.3	17	2.1	89	7.8
75-84	26	5.9	3	0.4	94	8.2

(Table continued)

85 and older	5	1.1	0	0	63	5.5
Total	442	100.0	809	100.0	1148	100.0

^a Deaths under the age of 5 were not included in this analysis.

^b \underline{M} = 40.9 years; \underline{SD} = 18.5 years; Range was 11 to 92 years.

^c \underline{M} = 31.4 years; \underline{SD} = 12.5 years; Range was 5 to 81 years.

^d \underline{M} = 42.8 years; \underline{SD} = 23.0 years; Range was 7 to 99 years.

of homicides and females 20.3% (\underline{n} = 164). In addition to accounting for the majority of deaths by both homicide and suicide, males also represented more accidental deaths (\underline{n} = 792, 69.0%) than females (\underline{n} = 356, 31.0%).

Race

Among those who died by suicide, the majority were White (\underline{n} = 346, 78.3%); 20.4% were Black (\underline{n} = 90); and only six (1.4%) of the victims of suicide during the period studied were categorized as “Other” (1 “Hispanic/Latino”, 2 “Asian/Oriental”, and 3 classified as “Other”). The majority of homicide victims were Black (\underline{n} = 671, 82.9%); while White victims represented only 16.3% (\underline{n} = 132) of deaths by homicide during the period studied. Six homicide victims (0.7%) were of the “Other” category (2 “Hispanic/Latino”, 3 “Asian/Oriental”, and 1 “Other”). Within the accidental deaths category, 684 (59.6%) victims were White and 454 (39.5%) were Black. In the “Other” category, there were 10 (0.9%) victims of accidental death (3 “Hispanic/Latino”, 6 “Asian/Oriental”, and 1 “Other”).

Method of Death

The fourth variable used to describe suicides, homicides and accidental deaths during the 11 year period of interest was method of death. The selected parish’s (county’s) coroner’s office categorizes method of death across 18 categories which the

researcher condensed to 10 (See Appendix B). Among suicide ($n = 303$, 68.6%) and homicide ($n = 631$, 78.0%) victims, the most common method was gunshot wound; the majority of victims of accidental death died in a vehicular-related accident ($n = 718$, 62.5%). Table 7 illustrates the frequencies for this nominal variable.

Table 7
Methods of Death by Type of Death in Study Parish (County), 1994-2004

Method	<u>Suicide</u>		<u>Homicide</u>		<u>Accident</u>	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Asphyxiation	60	13.6	22	2.7	9	0.8
Assault			54	6.7	0	0
Drowning	0	0	1	0.1	40	3.5
Electrocution	0	0	0	0	19	1.7
Gun	303	68.6	631	78.0	14	1.2
Knife	8	1.8	69	8.5	0	0
Jump/Fall	2	0.5	0	0	11	1.0
Poisoning	50	11.3	0	0	14	1.2
Vehicular	0	0	7	0.9	718	62.5
Other	18	4.1	25	3.1	267	23.3
Total	441 ^a	100.0	845	100.0	1202	100.0

^a For one case of suicide, method of death was not recorded.

Date of Birth

Date of birth was the fifth variable used to describe the people who suicided in the selected parish (county) during the period of investigation. For this shortened period (January 1, 1994 to September 23, 2003), the selected parish's (county's) coroner's

office recorded 399 suicides with 15 of these records missing dates of birth. Of these victims ($n = 384$), a total of 22 (10.0%) died in close temporal proximity to their dates of birth. One person died on the date of birth; seven died within 1 day of the date of birth, either before or after; one within four days of the birth date; four within five days of the birth date; three within six days of the date of birth; three within seven days; two within eight days; and one within 10 days of the birth date. Suicides more than 10 days before or after the date of birth were not considered related to birth date.

Date of Death

The date of death for each victim was obtained through the selected parish's (county's) coroner's office. The selected parish (county) experienced an average of 40 suicides per year ($SD = 5.9$), 74 homicides per year ($SD = 13.6$), and 104 accidental deaths per year ($SD = 18.5$) over the 11 year study period. Frequencies for each year are illustrated in Table 8.

Table 8
Deaths Per Year by Type of Death in Study Parish (County), 1994-2004

Year	<u>Suicide</u> ^a		<u>Homicide</u> ^b		<u>Accident</u> ^c		<u>Total</u>	
	n	% of Deaths per Year	n	% of Deaths per Year	n	% of Deaths per Year	n	% of Deaths per Year
1994	44	18.5	97	40.8	97	40.8	238	100.0
1995	39	19.4	78	38.8	84	41.8	201	100.0
1996	40	18.9	95	44.8	77	36.3	212	100.0
1997	51	23.3	80	36.5	88	40.2	219	100.0
1998	38	18.0	74	35.1	99	46.9	211	100.0

(Table continued)

1999	46	22.1	71	34.1	91	43.8	208	100.0
2000	28	14.1	65	32.8	105	53.0	198	100.0
2001	33	15.1	61	28.0	124	56.9	218	100.0
2002	43	17.6	78	31.8	124	50.6	245	100.0
2003	40	17.9	51	22.8	133	59.4	224	100.0
2004	40	17.8	59	26.2	126	56.0	225	100.0
<hr/>								
Total	442		809		1148		2399	

^a \bar{M} = 40 suicides per year; SD = 5.9 suicides; Range was 28 to 51.

^b \bar{M} = 74 homicides per year; SD = 13.6 homicides; Range was 51 to 97.

^c \bar{M} = 104 accidental deaths per year; SD = 18.5 accidental deaths; Range was 84 to 133.

Calls to the Local Crisis Intervention Center Hotline

Calls to the local crisis intervention center's hotline from January 1, 1996 to December 31, 2004 were described on the variables of gender of caller, type of call, and date of call. Eighteen of the 149,737 calls answered during this time period were not included in the analysis due to missing variables of interest. Additionally, 71,738 of the remaining 149,724 calls were excluded for reasons explained in the methodology of this study. A total of 77,981 calls were analyzed after being condensed into four researcher defined categories: "Crisis", "Suicide-Related", "Information", and "Non-Crisis" (See Appendix C).

Gender of Caller

The first variable of interest in the call data was gender. The researcher cautions that gender information used in this study may not be highly reliable due to method in which the crisis center hotline gathers gender data. (Phone counselors record data from one of three sources: the caller's report of gender and/or name [which may be fictitious],

the caller's voice [which may be masked], or the counselor records gender based on content of the phone call.) Females ($n = 52,750$, 67.6%) accounted for a majority of the calls to the hotline. Males represented 23,983 of the calls (30.8%) and for 1,248 of the calls (1.6%), gender was not reported. By type of call, females represented more than half of the callers within each call type. Among "Crisis" call records, females placed the majority of calls ($n = 30,980$, 67.4%) with males representing 14,730 of the callers (32.0%); 253 (0.6%) of the "Crisis" call records were missing data for the gender variable. "Suicide-related" calls were also placed more by women ($n = 6821$, 65.5%) than men ($n = 3428$, 32.9%) with 167 records missing gender information (1.6%). The majority of "Information" calls were placed by females also ($n = 12,743$, 71.2%) with males accounting for 25.0% of callers ($n = 4,482$) and 676 (3.8%) records missing gender information. For "Non-crisis" calls, females accounted for 59.6% of callers ($n = 2,206$) and males for 36.3% ($n = 1343$) with 152 (4.1%) records missing gender information.

Type of Call

The calls database, prior to removal of categories to be excluded, contained over 130 different codes for "Call Type". The researcher condensed these to four categories: "Crisis", "Suicide-Related", "Information", and "Non-Crisis". "Crisis" calls accounted for the majority of calls answered ($n = 45,963$, 58.9%). Callers seeking information (e.g. community resources) accounted for 23% ($n = 17,901$) of the calls included in this study. "Suicide-Related" calls accounted for 13.4% of calls answered by the crisis hotline ($n = 10,416$). Finally, 3,701 calls were of a "Non-Crisis" nature, accounting for 4.7% of calls included in the study.

Date of Call

Focusing on the calls that qualified for inclusion in this objective, the crisis hotline answered an average of 8,665 calls per year ($\underline{SD} = 1453.6$) during the study period. Of the 77,981 calls included in the analysis, an average of 5,107 “Crisis” calls ($\underline{SD} = 881.6$), 1,989 “Information” calls ($\underline{SD} = 376.2$), 1,157 “Suicide-Related” calls ($\underline{SD} = 261.4$), and 411 “Non-Crisis” calls ($\underline{SD} = 66.3$) were answered per year. Frequencies for each year are illustrated in Table 9.

Objective 2

Describe and compare the temporal distribution of suicides in a metropolitan Louisiana parish (county) from January 1, 1994 to December 31, 2004 with the temporal distributions of homicides and accidental deaths during the same period, exploring for trends on the variables day of the week of death, week of the month of death, and month of the year of death. Additionally, describe the distribution of calls to the local crisis center hotline on the variables of day of the week, week of the month, and month of the year.

Death Records

Day of the Week

Day of the week was the first variable used to describe the temporal distribution of deaths by suicide in this study. Friday ($\underline{M} = 7$, $\underline{SD} = 2.3$) was the most common day for suicides during the 11 years studied. Contrastingly, Saturday was the most common day for both the homicide and accidental death comparison groups ($\underline{M} = 13$, $\underline{SD} = 4.0$ and $\underline{M} = 19$, $\underline{SD} = 5.3$ respectively). In Table 10, an illustration is offered of the

distribution of deaths per day of the week by type and day of death over the 11 year period of this study.

Week of the Month

Week of the month was the second variable used to describe the temporal distribution of coroner investigated deaths in this study. The most common week of the month for suicides was week four ($\underline{M} = 10$, $\underline{SD} = 3.6$); for homicides it was weeks two and three ($\underline{M} = 17$, $\underline{SD} = 4.9$ and $\underline{M} = 17$, $\underline{SD} = 3.7$, respectively). Similar to suicides, the most common week for accidental deaths was week four ($\underline{M} = 25$, $\underline{SD} = 5.9$). Table 11 illustrates the distribution of suicides, homicides, and accidental deaths by week of the month.

Month of the Year

The third variable used to describe deaths by suicide was month of the year. The most common month of the year for suicides was July ($\underline{M} = 5$, $\underline{SD} = 2.1$). July was also the most common month for homicides ($\underline{M} = 8$, $\underline{SD} = 3.4$). However, for accidental deaths, December was the most common month ($\underline{M} = 10$, $\underline{SD} = 3.6$). Table 12 illustrates the distribution of deaths per month of the year by type of death and year.

Calls to the Local Crisis Intervention Center Hotline

Day of the Week of Call

Call data from the local crisis center hotline from January 1, 1996 to December 31, 2004 were analyzed on the variable "Day of the Week of Call". Over this nine year period, the majority of calls were answered on Mondays and Tuesdays ($\underline{n} = 12,612$, 16.2% and $\underline{n} = 12,199$, 15.6% respectively). The least popular days for calls to the crisis

Table 9

Calls Answered Per Year by Type of Call for Selected Crisis Hotline in Selected Parish (County), 1996-2004

	<u>Crisis</u> ^a		<u>Info.</u> ^b		<u>Suicide-Related</u> ^c		<u>Non-Crisis</u> ^d		<u>Total</u> ^e	
Year	N	%	n	%	n	%	n	%	n	%
1996	5841	12.7	1930	10.8	1609	15.4	458	12.4	9838	12.6
1997	5625	12.2	1805	10.1	1247	12.0	417	11.3	9094	11.7
1998	5311	11.6	1875	10.5	1103	10.6	362	9.8	8651	11.1
1999	4756	10.3	1823	10.2	1101	10.6	397	10.7	8077	10.4
2000	6293	13.7	2469	13.8	1442	13.8	491	13.3	10695	13.7
2001	6108	13.3	2773	15.5	1316	12.6	533	14.4	10730	13.8
2002	3936	8.6	2043	11.4	894	8.6	373	10.1	7246	9.3
2003	3965	8.6	1729	9.7	732	7.0	321	8.7	6747	8.7
2004	4128	9.0	1454	8.1	972	9.3	349	9.4	6903	8.9
Total	45963	100	17901	100	10416	100	3701	100	77981	100

^a M = 5107.0 calls per year; SD = 882.8 calls; Range was 3936 to 6293 calls.^b M = 1989.0 calls per year; SD = 377.1 calls; Range was 1454 to 2469 calls.^c M = 1157.3 calls per year; SD = 260.1 calls; Range was 732 to 1609 calls.^d M = 411.2 calls per year; SD = 66.3 calls; Range was 321 to 533 calls.^e M = 8664.6 calls per year; SD = 1456.3 calls; Range 6747 to 10730.

Table 10

Deaths Per Day of the Week by Year and Type of Death in Study Parish (County), 1994-2004

Day	Type of Death	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
		$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$
Sun ^a	Suicide	4 5.9	4 5.9	4 5.9	12 19.7	4 5.9	8 11.8	5 7.4	4 5.9	8 11.8	8 11.8	7 10.3	68 100.0
	Homicide	13 9.2	15 10.6	27 19.1	20 14.2	14 9.9	11 7.8	12 8.5	10 7.1	10 7.1	5 3.6	4 2.8	141 100.0
	Accident	10 5.3	20 10.5	10 5.3	20 10.5	15 7.9	16 8.4	16 8.4	17 8.9	24 12.6	23 12.1	19 10.0	190 100.0
Mon ^b	Suicide	4 6.6	4 6.6	6 9.8	3 4.9	7 11.5	8 13.1	5 8.2	4 6.6	4 6.6	6 9.8	10 16.4	61 100.0
	Homicide	13 12.4	14 13.3	7 6.7	7 6.7	14 13.3	10 9.5	5 4.8	3 2.9	13 12.4	7 6.7	12 11.4	105 100.0
	Accident	9 6.1	8 5.4	8 5.4	15 10.2	16 10.9	12 8.2	15 10.2	21 14.3	15 10.2	13 8.8	15 10.2	147 100.0

(Table continued)

Tues ^c	Suicide	4 6.7	8 13.3	5 8.3	6 10.0	5 8.3	4 6.7	4 6.7	5 8.3	10 16.7	6 10.0	3 5.0	60 100.0
	Homicide	8 7.8	10 9.7	13 12.6	13 12.6	5 4.9	9 8.7	10 9.7	7 6.8	15 14.6	9 8.7	4 3.9	103 100.0
	Accident	14 11.1	6 4.8	16 12.7	9 7.1	10 7.9	10 7.9	12 9.5	19 15.1	12 9.5	9 7.1	9 7.1	126 100.0
Wed ^d	Suicide	11 15.7	5 7.1	10 14.3	4 5.7	8 11.4	11 15.7	1 1.4	5 7.1	6 8.6	4 5.7	5 7.1	70 100.0
	Homicide	21 21.4	3 3.1	11 11.2	7 7.1	11 15.7	8 8.2	8 8.2	13 13.3	5 5.1	7 7.1	4 4.1	98 100.0
	Accident	22 13.5	10 6.1	8 4.9	12 7.4	11 6.7	9 5.5	16 9.8	17 10.4	27 16.6	11 6.7	20 12.3	163 100.0
Thu ^e	Suicide	8 11.8	9 13.2	7 10.3	10 14.7	5 7.4	5 7.4	6 8.8	6 8.8	3 4.4	5 7.4	4 5.9	68 100.0
	Homicide	15 15.0	11 11.0	6 6.0	6 6.0	9 9.0	10 10.0	10 10.0	7 7.0	13 13.0	3 3.0	10 10.0	100 100.0
	Accident	11 6.7	13 8.0	16 9.8	6 3.7	14 8.6	14 8.6	12 7.4	13 8.0	16 9.8	21 12.9	27 16.6	163 100.0

(Table continued)

Fri ^f	Suicide	10 12.8	8 10.3	4 5.1	12 15.4	6 7.7	7 9.0	4 5.1	7 9.0	7 9.0	8 10.8	5 6.4	78 100.0
	Homicide	11 9.2	17 14.3	15 12.6	8 6.7	10 8.4	8 6.7	12 10.1	8 6.7	15 12.6	8 6.7	7 5.9	119 100.0
	Accident	5 3.4	9 6.2	9 6.2	14 9.6	18 12.3	9 6.2	12 8.2	18 12.3	11 7.5	25 17.1	16 11.0	146 100.0
Sat ^g	Suicide	3 8.1	1 2.7	4 10.8	4 10.8	3 8.1	3 8.1	3 8.1	2 5.4	5 13.5	3 8.1	6 16.2	37 100.0
	Homicide	16 11.2	8 5.6	16 11.2	19 13.3	11 7.7	15 10.5	8 5.6	13 9.1	7 4.9	12 8.4	18 12.6	143 100.0
	Accident	16 7.9	18 8.9	10 4.9	12 5.9	15 7.4	21 10.3	22 10.8	19 9.4	19 9.4	31 15.3	20 9.9	203 100.0
Total	Suicide	44 10.0	39 8.8	40 9.0	51 11.5	38 8.6	46 10.4	28 6.3	33 7.5	43 9.7	40 9.0	40 9.0	809 100.0
	Homicide	97 12.0	78 9.6	95 11.7	80 9.9	74 9.1	71 8.8	65 8.0	61 7.5	78 9.6	51 6.3	59 7.3	442 100.0
	Accident	97 8.4	84 7.3	77 6.7	88 7.7	99 8.6	91 7.9	105 9.1	124 10.8	124 10.8	133 11.6	126 11.0	1148 100.0

^a M = 6 suicides on Sundays; SD = 2.5 suicides; Range was 4 to 12.

M = 13 homicides on Sundays; SD = 6.2 homicides; Range was 4 to 27.

M = 17 accidental deaths on Sundays; SD = 4.4 accidental deaths; Range was 10 to 24.

(Table continued)

- ^b M = 6 suicides on Mondays; SD = 2.0 suicides; Range was 3 to 10.
M = 10 homicides on Mondays; SD = 3.7 homicides; Range was 3 to 14.
M = 13 accidental deaths on Mondays; SD = 3.7 accidental deaths; Range was 8 to 21.
- ^c M = 6 suicides on Tuesdays; SD = 1.9 suicides; Range was 3 to 10.
M = 9 homicides on Tuesdays; SD = 3.2 homicides; Range was 4 to 15.
M = 12 accidental deaths on Tuesdays; SD = 3.5 accidental deaths; Range was 6 to 19.
- ^d M = 6 suicides on Wednesdays; SD = 3.1 suicides; Range was 1 to 11.
M = 9 homicides on Wednesdays; SD = 4.8 homicides; Range was 3 to 21.
M = 15 accidental deaths on Wednesdays; SD = 5.8 accidental deaths; Range was 8 to 27.
- ^e M = 6 suicides on Thursdays; SD = 2.0 suicides; Range was 3 to 10.
M = 9 homicides on Thursdays; SD = 3.3 homicides; Range was 3 to 15.
M = 15 accidental deaths on Thursdays; SD = 5.2 accidental deaths; Range was 6 to 27.
- ^f M = 7 suicides on Fridays; SD = 2.3 suicides; Range was 4 to 12.
M = 12 homicides on Fridays; SD = 3.8 homicides; Range was 8 to 17.
M = 14 accidental deaths on Fridays; SD = 4.7 accidental deaths; Range was 9 to 25.
- ^g M = 3 suicides on Saturdays; SD = 1.3 suicides; Range was 1 to 6.
M = 13 homicides on Saturdays; SD = 4.0 homicides; Range was 7 to 19.
M = 19 accidental deaths on Saturdays; SD = 5.3 accidental deaths; Range was 12 to 31.

Table 11

Deaths for Week of the Month by Month of the Year and Type of Death in Selected Parish (County), 1994-2004

Month	Type of Death	Week 1 ^a	Week 2 ^b	Week 3 ^c	Week 4 ^d	Week 5 ^e	Week 6 ^f	Total
		$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$
Jan	Suicide	8 19.0	9 21.4	7 16.7	12 28.6	6 14.3	0 0.0	42 100.0
	Homicide	10 13.0	17 22.1	27 35.1	17 22.1	5 6.5	1 1.3	77 100.0
	Accident	10 9.5	27 25.7	21 20.0	30 28.6	17 16.2	0 0.0	105 100.0
Feb	Suicide	1 3.1	9 28.1	8 25.0	10 31.3	4 12.5		32 100.0
	Homicide	6 11.1	7 13.0	20 37.0	14 25.9	7 13.0		54 100.0
	Accident	8 10.5	17 22.4	15 19.7	26 34.2	10 13.2		77 100.0

(Table continued)

Mar	Suicide	3 11.1	4 14.8	8 29.6	7 25.9	4 14.8	1 3.7	27 100.0
	Homicide	6 10.5	13 22.8	19 33.3	15 26.3	3 5.3	1 1.8	57 100.0
	Accident	16 14.4	31 27.9	16 14.4	36 32.4	10 9.0	2 1.8	111 100.0
April	Suicide	2 5.9	9 26.5	10 29.4	8 23.5	5 14.7	0 0.0	34 100.0
	Homicide	9 14.5	18 29.0	11 17.7	16 25.8	8 12.9	0 0.0	62 100.0
	Accident	12 12.1	22 22.2	18 18.2	35 35.4	12 12.1	0 0.0	99 100.0
May	Suicide	5 14.7	10 29.4	6 17.6	10 29.4	3 8.8	0 0.0	34 100.0
	Homicide	6 8.2	16 21.9	17 23.3	16 21.9	17 23.3	1 1.4	73 100.0
	Accident	10 10.2	15 15.3	21 21.4	28 28.6	24 24.5	0 0.0	98 100.0

(Table continued)

June	Suicide	6 17.1	12 34.3	7 20.0	5 14.3	5 14.3	0 0.0	35 100.0
	Homicide	11 15.1	16 21.9	14 19.2	18 24.7	14 19.2	0 0.0	73 100.0
	Accident	8 9.2	24 27.6	19 21.8	26 29.9	10 11.5	0 0.0	98 100.0
July	Suicide	4 8.7	10 21.7	9 19.6	20 43.5	3 6.5	0 0.0	46 100.0
	Homicide	11 12.9	28 32.9	16 18.8	17 20.0	12 14.1	1 1.2	85 100.0
	Accident	11 10.2	20 18.5	32 29.6	26 24.1	18 16.7	1 0.9	108 100.0
Aug	Suicide	5 12.8	8 20.5	11 28.2	8 20.5	7 17.9	0 0.0	39 100.0
	Homicide	9 13.0	17 24.6	13 18.8	19 27.5	11 15.9	0 0.0	69 100.0
	Accident	13 14.0	28 30.1	17 18.3	19 20.4	14 15.1	2 2.2	93 100.0

(Table continued)

Sep	Suicide	7 15.9	9 20.5	12 27.3	7 15.9	6 13.6	3 6.8	44 100.0
	Homicide	16 20.0	16 20.0	18 22.5	21 26.3	8 10.0	1 1.3	80 100.0
	Accident	16 21.6	15 21.6	12 16.2	16 21.6	15 20.3	0 0.0	74 100.0
Oct	Suicide	8 20.0	6 15.0	8 20.0	9 22.5	9 22.5	0 0.0	40 100.0
	Homicide	10 16.9	10 16.9	11 18.6	14 23.7	14 23.7	0 0.9	59 100.0
	Accident	15 16.9	23 25.8	19 21.3	18 20.2	12 13.5	2 2.2	89 100.0
Nov	Suicide	5 13.2	10 26.3	8 21.1	6 15.8	9 23.7	0 0.0	38 100.0
	Homicide	10 16.1	18 29.0	19 30.6	11 17.7	4 6.5	0 0.0	62 100.0
	Accident	14 14.1	25 25.3	23 23.2	22 22.2	11 11.1	4 4.0	99 100.0

(Table continued)

Dec	Suicide	3 9.7	7 22.6	7 22.6	9 29.0	5 16.2	0 0.0	31 100.0
	Homicide	7 12.3	19 33.3	13 22.8	7 12.3	10 17.5	1 1.8	57 100.0
	Accident	10 9.2	23 21.2	28 25.7	24 22.0	23 21.1	1 0.9	109 100.0
Total	Suicide	55	106	102	116	64	6	
	Homicide	106	202	202	185	106	7	
	Accident	142	267	242	298	176	8	

^a \bar{M} = 5 suicides per week 1; SD = 2.2 suicides; Range was 1 to 8.

\bar{M} = 9 homicides per week 1; SD = 2.7 homicides; Range was 1 to 16.

\bar{M} = 12 accidental deaths per week 1; SD = 2.8 accidental deaths; Range was 8 to 16.

^b \bar{M} = 9 suicides per week 2; SD = 2.0 suicides; Range was 4 to 12.

\bar{M} = 16 homicides per week 2; SD = 4.9 homicides; Range was 7 to 28.

\bar{M} = 23 accidental deaths per week 2; SD = 4.8 accidental deaths; Range was 15 to 28.

^c \bar{M} = 8 suicides per week 3; SD = 1.7 suicides; Range was 6 to 12.

\bar{M} = 17 homicides per week 3; SD = 4.4 homicides; Range was 11 to 27.

\bar{M} = 20 accidental deaths per week 3; SD = 5.3 accidental deaths; Range was 15 to 32.

^d \bar{M} = 9 suicides per week 4; SD = 3.7 suicides; Range was 5 to 20.

\bar{M} = 15 homicides per week 4; SD = 3.5 homicides; Range was 7 to 19.

\bar{M} = 26 accidental deaths per week 4; SD = 6.0 accidental deaths; Range was 18 to 36.

^e \bar{M} = 6 suicides per week 5; SD = 1.9 suicides; Range was 3 to 9.

\bar{M} = 9 homicides per week 5; SD = 4.2 homicides; Range was 3 to 14.

\bar{M} = 15 accidental deaths per week 5; SD = 4.7 accidental deaths; Range was 10 to 24.

^f \bar{M} = 2 suicides per week 6; SD = 1.0 suicides; Range was 0 to 3.

(Table continued)

M = 1 homicides per week 6; SD = 0.0 homicides; Range was 0 to 1.

M = 2 accidental deaths per week 6; SD = 1.0 accidental deaths; Range was 0 to 4.

Table 12

Deaths per Month of the Year by Year and Type of Death in Study Parish (County), 1994-2004

Month	Type of Death	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
		<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %
Jan ^a	Suicide	5 11.9	2 4.8	5 11.9	2 4.8	2 4.8	5 11.9	3 7.1	5 11.9	3 7.1	3 7.1	7 16.7	42 100.0
	Homicide	12 15.6	5 6.5	12 15.6	11 14.3	10 13.0	5 6.5	3 3.9	3 3.9	11 14.3	3 3.9	2 2.6	77 100.0
	Accident	5 4.8	3 2.9	8 7.6	10 9.5	12 11.4	10 9.5	8 7.6	13 12.4	14 13.3	7 6.7	15 14.3	105 100.0
Feb ^b	Suicide	2 6.3	2 6.3	2 6.3	1 3.1	5 15.6	2 6.3	2 6.3	4 12.5	3 9.4	3 9.4	6 18.8	32 100.0
	Homicide	9 16.7	4 7.4	10 18.5	4 7.4	3 5.6	4 7.4	7 13.0	4 7.4	3 5.6	3 5.6	3 5.6	54 100.0
	Accident	4 5.3	10 13.2	9 11.8	3 3.9	8 10.5	4 5.3	5 6.6	7 9.2	10 13.2	9 11.8	7 9.2	76 100.0

(Table continued)

Mar ^c	Suicide	7 25.9	2 7.4	1 3.7	4 14.8	1 3.7	3 11.1	0 0.0	1 3.7	2 7.4	4 14.8	2 7.4	27 100.0
	Homicide	14 24.6	3 5.3	2 3.5	6 10.5	6 10.5	6 10.5	4 7.0	4 7.0	5 8.8	3 5.3	4 7.0	57 100.0
	Accident	11 9.9	8 7.2	5 4.5	8 7.2	9 8.1	7 6.3	11 9.9	14 12.6	12 10.8	12 10.8	14 12.6	111 100.0
April ^d	Suicide	4 11.8	1 2.9	0 0.0	4 11.8	4 11.8	2 5.9	2 5.9	4 11.8	7 20.6	3 8.8	3 8.8	34 100.0
	Homicide	2 3.2	6 9.7	10 16.1	6 9.7	5 8.1	2 3.2	9 14.5	6 9.7	4 6.5	6 9.7	6 9.7	62 100.0
	Accident	13 13.1	3 3.0	4 4.0	3 3.0	6 6.1	7 7.1	11 11.1	16 16.2	11 11.1	9 9.1	16 16.2	99 100.0
May ^e	Suicide	3 8.8	5 14.7	1 2.9	3 8.8	2 5.9	3 8.8	2 5.9	4 11.8	7 20.6	2 5.9	2 5.9	34 100.0
	Homicide	7 9.6	5 6.8	8 11.0	6 8.2	10 13.7	7 9.6	5 6.8	5 6.8	7 9.6	5 6.8	8 11.0	73 100.0
	Accident	7 7.1	2 2.0	10 10.2	8 8.2	12 12.2	6 6.1	8 8.2	5 5.1	13 13.3	15 15.3	12 12.2	98 100.0

(Table continued)

June ^f	Suicide	5 13.9	5 13.9	1 2.8	3 8.3	2 5.6	3 8.3	2 5.6	4 11.1	7 19.4	2 5.6	2 5.6	36 100.0
	Homicide	8 11.0	9 12.3	12 16.4	9 12.3	6 8.2	6 8.2	7 9.6	4 5.5	3 4.1	5 6.8	4 5.5	73 100.0
	Accident	4 4.6	7 8.0	7 8.0	13 14.9	9 10.3	8 9.2	7 8.0	6 6.9	12 13.8	6 6.9	8 9.2	87 100.0
July ^g	Suicide	2 4.3	4 8.7	6 13.0	7 15.2	8 17.4	4 8.7	5 5.9	0 0.0	3 6.5	1 2.2	6 13.0	46 100.0
	Homicide	11 12.9	6 7.1	9 10.6	10 11.8	7 8.2	13 15.3	2 2.4	12 14.1	4 4.7	5 5.9	6 7.1	85 100.0
	Accident	13 12.0	15 13.9	5 4.6	5 4.6	10 9.3	8 7.4	7 6.5	15 13.9	10 9.3	11 10.2	9 8.3	108 100.0
Aug ^h	Suicide	4 25.6	6 15.4	4 25.6	4 25.6	1 2.6	4 25.6	2 5.1	1 2.6	5 12.8	5 12.8	3 7.7	39 100.0
	Homicide	9 13.0	10 14.5	5 7.2	7 10.1	3 4.3	5 7.2	6 8.7	4 5.8	11 15.9	1 1.4	8 11.6	69 100.0
	Accident	14 15.1	7 7.5	6 6.5	5 5.4	9 9.7	9 9.7	4 4.3	13 14.0	7 7.5	10 10.8	9 9.7	93 100.0

(Table continued)

Sep ⁱ	Suicide	4 9.1	3 6.8	6 13.6	4 9.1	4 9.1	4 9.1	4 9.1	4 9.1	5 11.4	5 11.4	1 2.3	44 100.0
	Homicide	10 12.5	12 15.0	6 7.5	5 6.3	8 10.0	6 7.5	9 11.3	4 5.0	10 12.5	8 10.0	2 2.5	80 100.0
	Accident	6 8.1	7 9.5	4 5.4	10 13.5	5 6.8	7 9.5	10 13.5	3 4.1	2 2.7	10 13.5	10 13.5	74 100.0
Oct ^j	Suicide	3 7.5	6 15.0	4 10.0	5 12.5	3 7.5	4 10.0	1 2.5	4 10.0	1 2.5	6 15.0	3 7.5	40 100.0
	Homicide	2 3.3	7 11.7	6 10.0	5 8.3	8 13.3	7 11.7	4 6.7	5 8.3	5 8.3	2 3.3	9 15.0	60 100.0
	Accident	5 5.6	6 6.7	5 5.6	9 10.1	3 3.4	5 5.6	12 13.5	12 13.5	14 15.7	10 11.2	8 9.0	89 100.0
Nov ^k	Suicide	3 7.9	1 2.6	4 10.5	6 15.8	2 5.3	6 15.8	4 10.5	4 10.5	0 0.0	5 13.2	3 7.9	38 100.0
	Homicide	4 6.5	6 9.7	6 9.7	4 6.5	4 6.5	4 6.5	7 11.3	8 12.9	7 11.3	7 11.3	5 8.1	62 100.0
	Accident	10 10.1	5 5.1	5 5.1	4 4.0	10 10.1	11 11.1	12 12.1	5 5.1	11 11.1	16 16.2	10 10.1	99 100.0

(Table continued)

Dec ^l	Suicide	2 6.5	2 6.5	1 3.2	6 19.4	3 9.7	8 25.8	0 0.0	2 6.5	2 6.5	2 6.5	3 9.7	31 100.0
	Homicide	9 15.8	5 8.8	9 15.8	7 12.3	4 7.0	6 10.5	2 3.5	2 3.5	8 14.0	3 5.3	2 3.5	57 100.0
	Accident	5 4.6	11 10.1	9 8.3	10 9.2	6 5.5	9 8.3	10 9.2	15 13.8	8 7.3	18 16.5	8 7.3	109 100.0
Total	Suicide	44	39	40	51	38	46	28	33	43	40	40	442
	Homicide	97	78	95	80	74	71	65	61	78	51	59	809
	Accident	97	84	77	88	99	91	105	124	124	133	126	1148

- ^a \bar{M} = 4 suicides in January; \underline{SD} = 1.6 suicides; Range was 2 to 7.
 \bar{M} = 7 homicides in January; \underline{SD} = 4.0 homicides; Range was 2 to 12.
 \bar{M} = 10 accidental deaths in January; \underline{SD} = 3.6 accidental deaths; Range was 3 to 15.
- ^b \bar{M} = 3 suicides in February; \underline{SD} = 1.4 suicides; Range was 1 to 6.
 \bar{M} = 5 homicides in February; \underline{SD} = 2.4 homicides; Range was 3 to 9.
 \bar{M} = 7 accidental deaths in February; \underline{SD} = 2.4 accidental deaths; Range was 3 to 10.
- ^c \bar{M} = 3 suicides in March; \underline{SD} = 1.7 suicides; Range was 1 to 7.
 \bar{M} = 6 homicides in March; \underline{SD} = 3.4 homicides; Range was 2 to 14.
 \bar{M} = 10 accidental deaths in March; \underline{SD} = 2.8 accidental deaths; Range was 5 to 14.
- ^d \bar{M} = 3 suicides in April; \underline{SD} = 1.6 suicides; Range was 1 to 7.
 \bar{M} = 6 homicides in April; \underline{SD} = 2.3 homicides; Range was 2 to 10.
 \bar{M} = 9 accidental deaths in April; \underline{SD} = 4.6 accidental deaths; Range was 3 to 16.
- ^e \bar{M} = 3 suicides in May; \underline{SD} = 1.6 suicides; Range was 1 to 7.
 \bar{M} = 7 homicides in May; \underline{SD} = 1.6 homicides; Range was 5 to 10.
 \bar{M} = 9 accidental deaths in May; \underline{SD} = 3.7 accidental deaths; Range was 2 to 15.

(Table continued)

- ^f \underline{M} = 4 suicides in June; \underline{SD} = 1.7 suicides; Range was 1 to 6.
 \underline{M} = 7 homicides in June; \underline{SD} = 2.6 homicides; Range was 3 to 12.
 \underline{M} = 8 accidental deaths in June; \underline{SD} = 2.5 accidental deaths; Range was 4 to 13.
- ^g \underline{M} = 5 suicides in July; \underline{SD} = 2.1 suicides; Range was 1 to 8.
 \underline{M} = 8 homicides in July; \underline{SD} = 3.4 homicides; Range was 2 to 13.
 \underline{M} = 10 accidental deaths in July; \underline{SD} = 3.4 accidental deaths; Range was 5 to 15.
- ^h \underline{M} = 4 suicides in August; \underline{SD} = 1.6 suicides; Range was 1 to 6.
 \underline{M} = 6 homicides in August; \underline{SD} = 2.9 homicides; Range was 1 to 11.
 \underline{M} = 9 accidental deaths in August; \underline{SD} = 3.0 accidental deaths; Range was 4 to 14.
- ⁱ \underline{M} = 4 suicides in September; \underline{SD} = 1.2 suicides; Range was 1 to 6.
 \underline{M} = 7 homicides in September; \underline{SD} = 2.8 homicides; Range was 2 to 12.
 \underline{M} = 7 accidental deaths in September; \underline{SD} = 2.9 accidental deaths; Range was 2 to 10.
- ^j \underline{M} = 4 suicides in October; \underline{SD} = 1.6 suicides; Range was 1 to 6.
 \underline{M} = 6 homicides in October; \underline{SD} = 2.1 homicides; Range was 2 to 9.
 \underline{M} = 8 accidental deaths in October; \underline{SD} = 3.4 accidental deaths; Range was 3 to 14.
- ^k \underline{M} = 4 suicides in November; \underline{SD} = 1.5 suicides; Range was 1 to 6.
 \underline{M} = 6 homicides in November; \underline{SD} = 1.4 homicides; Range was 4 to 8.
 \underline{M} = 9 accidental deaths in November; \underline{SD} = 3.6 accidental deaths; Range was 4 to 16.
- ^l \underline{M} = 3 suicides in December; \underline{SD} = 2.1 suicides; Range was 1 to 8.
 \underline{M} = 5 homicides in December; \underline{SD} = 2.7 homicides; Range was 2 to 9.
 \underline{M} = 10 accidental deaths in December; \underline{SD} = 3.6 accidental deaths; Range was 5 to 18.

center hotline were Saturdays and Sundays ($\underline{n} = 9,572$, 12.3% and $\underline{n} = 9,266$, 11.9% respectively). By call type, Mondays were the most popular day on average for “Crisis” calls ($\underline{M} = 796$, $\underline{SD} = 163.9$), “Information” calls ($\underline{M} = 371$, $\underline{SD} = 72.8$), and “Non-crisis” calls ($\underline{M} = 62$, $\underline{SD} = 17.6$). “Suicide-related” calls were most common on Tuesdays ($\underline{M} = 765$, $\underline{SD} = 356.1$). Table 13 illustrates the frequencies of types of calls by day of the week over the nine year period studied.

Week of the Month of Call

Week of the month was another variable used to describe the temporal distribution of calls in this study. The most common week of the month for “Crisis” calls and “Suicide-related” calls was week two ($\underline{M} = 888$, $\underline{SD} = 72.4$ and $\underline{M} = 205$, $\underline{SD} = 18.2$, respectively); for “Information” and “Non-crisis” calls, it was week three ($\underline{M} = 348$, $\underline{SD} = 57.7$ and $\underline{M} = 71$, $\underline{SD} = 11.3$, respectively). Table 14 illustrates the frequencies of types of calls by week of the month.

Month of the Year of Call

Call data from the local crisis center hotline from January 1, 1996 to December 31, 2004 were analyzed on the variable “Month of Call”. The month of July was the most popular for calls ($\underline{n} = 7,580$, 9.7%). The least popular month was December ($\underline{n} = 5,454$, 7.0%). For all four types of calls, July was the most popular month ($\underline{n} = 4,483$, 59.1%; $\underline{n} = 1,775$, 23.4%; $\underline{n} = 960$, 12.7%; and $\underline{n} = 362$, 4.8% respectively). December was the least popular month for “Crisis” calls ($\underline{n} = 3,262$, 59.8%), “Information” calls ($\underline{n} = 1,153$, 21.1%), and “Suicide-Related” calls ($\underline{n} = 757$, 13.9%). For “Non-crisis” calls, October was the least popular month ($\underline{n} = 275$, 4.3%). Table 15 illustrates the frequencies of types of calls by month of the year over the nine year period studied.

Table 13

Calls per Day of the Week by Year and Type of Call in Study Parish (County), 1996-2004

Day	Type of Call	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
		$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$	$\frac{n}{\%}$
Sun ^a	Crisis	706 11.8	770 12.8	645 10.7	616 10.3	813 13.5	768 12.8	523 8.7	563 9.4	597 9.9	6001 100.0
	Information	137 10.5	126 9.6	142 10.7	123 9.4	185 14.2	195 14.9	113 8.6	148 11.3	138 10.6	1307 100.0
	Suicide-Related	214 14.5	186 12.6	158 10.7	146 9.9	245 16.6	161 10.9	116 7.9	102 6.9	144 9.8	1472 100.0
	Non-Crisis	47 9.7	74 15.3	56 11.5	53 10.9	69 14.2	71 14.6	34 7.0	41 8.5	40 8.2	485 100.0
Mon ^b	Crisis	972 13.6	850 11.9	846 11.8	696 9.7	1011 14.1	984 13.7	590 8.2	584 8.1	633 8.8	7166 100.0
	Information	358 10.7	340 10.2	334 10.0	365 10.9	453 13.6	508 15.2	411 12.3	319 9.6	247 7.4	3335 100.0
	Suicide-Related	243 15.7	184 11.9	155 10.0	167 10.8	229 14.8	185 12.0	152 9.8	90 5.8	141 9.1	1546 100.0
	Non-Crisis	75 13.5	63 11.4	41 7.4	55 9.9	67 12.1	98 17.7	66 11.9	35 6.3	55 9.9	555 100.0

(Table continued)

Tues ^c	Crisis	897 13.0	842 12.2	830 12.1	681 9.9	980 14.2	842 12.2	586 8.5	631 9.2	596 8.7	6885 100.0
	Information	366 11.4	312 9.7	344 10.7	332 10.4	415 12.9	548 17.1	370 11.5	262 8.2	256 8.0	3205 100.0
	Suicide-Related	280 17.9	184 11.8	172 11.0	158 10.1	198 12.7	192 12.3	142 9.1	113 7.2	126 8.1	1565 100.0
	Non-Crisis	68 12.5	65 11.9	51 9.4	65 11.9	70 12.9	81 14.9	56 10.3	42 7.7	46 8.5	544 100.0
Wed ^d	Crisis	830 12.6	785 11.9	749 11.3	712 10.8	927 14.0	883 13.4	566 8.6	559 8.5	597 9.0	6608 100.0
	Information	349 11.6	316 10.5	310 10.3	281 9.3	433 14.4	463 15.4	348 11.6	279 9.3	230 7.6	3009 100.0
	Suicide-Related	224 14.6	189 12.3	145 9.5	172 11.2	210 13.7	216 14.1	136 8.9	104 6.8	138 9.0	1534 100.0
	Non-Crisis	68 13.4	57 11.2	50 9.8	51 10.0	66 13.0	69 13.6	51 6.3	56 11.0	41 8.1	509 100.0

(Table continued)

Thu ^e	Crisis	854 12.9	787 11.9	774 11.7	700 10.6	886 13.4	908 13.8	588 8.9	526 8.0	579 8.8	6602 100.0
	Information	280 9.4	317 10.7	321 10.8	314 10.6	391 13.2	464 15.6	352 11.9	272 9.2	255 8.6	2966 100.0
	Suicide-Related	230 15.9	163 11.3	164 11.3	138 9.6	210 14.5	172 11.9	127 8.8	92 6.4	149 10.3	1445 100.0
	Non-Crisis	74 13.5	44 8.0	63 11.5	55 10.0	71 13.0	68 12.4	60 10.9	47 8.6	66 12.0	548 100.0
Fri ^f	Crisis	834 12.8	789 12.1	740 11.4	728 11.2	836 12.8	881 13.5	579 8.9	562 8.6	570 8.7	6519 100.0
	Information	284 10.6	245 9.2	280 10.5	278 10.4	378 14.1	409 15.3	316 11.8	277 10.4	209 7.8	2676 100.0
	Suicide-Related	202 14.7	169 12.3	155 11.3	152 15.2	161 11.7	176 12.8	108 7.9	124 9.0	128 9.3	1375 100.0
	Non-Crisis	62 11.4	49 9.0	52 9.6	57 10.5	82 15.1	73 13.4	58 10.7	58 10.7	52 9.6	543 100.0

(Table continued)

Sat ^g	Crisis	748 12.1	802 13.0	727 11.8	623 10.1	882 14.3	791 12.8	513 8.3	540 8.7	556 9.0	6182 100.0
	Information	156 11.2	149 10.7	144 10.3	130 9.3	209 15.0	179 12.8	135 9.7	172 12.3	119 8.5	1393 100.0
	Suicide-Related	216 14.6	172 11.6	154 10.4	168 11.4	209 14.1	194 13.1	113 7.6	107 7.2	146 9.9	1479 100.0
	Non-Crisis	64 12.4	65 12.6	49 9.5	61 11.8	66 12.8	73 14.1	48 9.3	42 8.1	49 9.4	517 100.0

^a M = 667 crisis calls on Sundays; SD = 96.1 calls; Range was 523 to 813.

M = 145 information calls on Sundays; SD = 26.0 calls; Range was 113 to 195.

M = 164 suicide-related calls on Sundays; SD = 42.8 calls; Range was 102 to 245.

M = 54 non-crisis calls on Sundays; SD = 13.9 calls; Range was 41 to 74.

^b M = 796 crisis calls on Mondays; SD = 163.9 calls; Range was 584 to 1011.

M = 371 information calls on Mondays; SD = 72.8 calls; Range was 247 to 453.

M = 172 suicide-related calls on Mondays; SD = 43.5 calls; Range was 90 to 229.

M = 62 non-crisis calls on Mondays; SD = 17.6 calls; Range was 35 to 98.

^c M = 765 crisis calls on Tuesdays; SD = 135.5 calls; Range was 586 to 980.

M = 356 information calls on Tuesdays; SD = 83.1 calls; Range was 256 to 548.

M = 174 suicide-related calls on Tuesdays; SD = 46.6 calls; Range was 113 to 280.

M = 60 non-crisis calls on Tuesdays; SD = 11.9 calls; Range was 42 to 81.

^d M = 734 crisis calls on Wednesdays; SD = 128.9 calls; Range was 559 to 927.

M = 334 information calls on Wednesdays; SD = 70.2 calls; Range was 230 to 463.

M = 170 suicide-related calls on Wednesdays; SD = 39.7 calls; Range was 104 to 224.

M = 57 non-crisis calls on Wednesdays; SD = 9.0 calls; Range was 41 to 69.

^e M = 734 crisis calls on Thursdays; SD = 134.1 calls; Range was 526 to 908.

M = 330 information calls on Thursdays; SD = 61.6 calls; Range was 255 to 464.

(Table continued)

M = 161 suicide-related calls on Thursdays; SD = 39.3 calls; Range was 92 to 210.

M = 61 non-crisis calls on Thursdays; SD = 9.8 calls; Range was 44 to 74.

^f M = 724 crisis calls on Fridays; SD = 117.7 calls; Range was 562 to 881.

M = 297 information calls on Fridays; SD = 58.8 calls; Range was 245 to 409.

M = 153 suicide-related calls on Fridays; SD = 27.4 calls; Range was 108 to 202.

M = 60 non-crisis calls on Fridays; SD = 10.1 calls; Range was 52 to 82.

^g M = 687 crisis calls on Saturdays; SD = 125.0 calls; Range was 513 to 882.

M = 155 information calls on Saturdays; SD = 26.4 calls; Range was 130 to 209.

M = 164 suicide-related calls on Saturdays; SD = 36.5 calls; Range was 107 to 216.

M = 54 non-crisis calls on Saturdays; SD = 10.0 calls; Range was 42 to 73.

Table 14

Type of Call by Week of the Month to the Selected Crisis Hotline in Selected Parish (County), 1996-2004

Month	Type of Call	Week 1 ^a	Week 2 ^b	Week 3 ^c	Week 4 ^d	Week 5 ^e	Week 6 ^f	Total
		<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	<u>n</u> %	%
Jan	Crisis	678 16.2	926 22.1	893 21.4	941 22.5	714 17.1	26 0.6	4178 100.0
	Information	222 13.4	337 20.4	385 23.3	385 23.3	302 18.3	20 1.2	1651 100.0
	Suicide-Related	129 14.8	214 24.5	179 20.5	212 24.2	132 15.1	8 0.9	874 100.0
	Non-Crisis	45 13.6	65 19.7	89 27.0	70 21.2	61 18.5	0 0.0	330 100.0

(Table continued)

Feb	Crisis	435 11.6	941 25.1	906 24.2	898 24.0	566 15.1		3746 100.0
	Information	143 10.1	353 25.0	350 24.8	347 24.6	218 15.5		1411 100.0
	Suicide-Related	77 9.6	195 24.2	200 24.8	220 27.3	113 14.0		805 100.0
	Non-Crisis	35 12.1	62 21.5	65 22.5	79 27.3	48 16.6		289 100.0
Mar	Crisis	447 11.9	923 24.5	816 21.6	819 21.7	707 18.7	59 1.6	3771 100.0
	Information	158 11.1	331 23.3	316 22.2	345 24.2	243 17.1	30 2.1	1423 100.0
	Suicide-Related	112 12.5	224 24.9	191 21.3	198 22.0	161 17.9	12 1.3	898 100.0
	Non-Crisis	32 9.8	91 27.8	70 21.4	65 19.9	69 21.1	0 0.0	327 100.0

(Table continued)

April	Crisis	589 15.4	875 22.8	895 23.3	871 22.7	587 15.3	16 0.4	3833 100.0
	Information	197 12.9	372 24.3	359 23.4	327 21.3	268 17.5	10 0.7	1533 100.0
	Suicide-Related	126 13.6	212 22.8	211 22.7	220 23.7	158 17.0	2 0.2	929 100.0
	Non-Crisis	39 13.0	76 25.2	85 28.2	53 17.6	47 15.6	1 0.3	301 100.0
May	Crisis	523 13.1	902 22.6	902 22.6	930 23.3	705 17.7	25 0.6	3987 100.0
	Information	128 9.1	312 22.2	337 24.1	308 22.0	303 21.6	13 0.9	1401 100.0
	Suicide-Related	98 11.0	224 25.1	189 21.2	216 24.3	158 17.8	5 0.6	890 100.0
	Non-Crisis	32 9.4	93 27.4	91 26.8	65 19.2	53 15.6	5 1.4	339 100.0

(Table continued)

June	Crisis	381 10.3	726 19.6	910 24.6	943 25.5	706 19.1	37 1.0	3703 100.0
	Information	138 9.0	294 19.2	345 22.5	361 23.5	386 25.1	11 0.7	1535 100.0
	Suicide-Related	83 10.3	167 20.7	191 23.7	216 26.8	142 17.6	7 0.9	806 100.0
	Non-Crisis	24 8.0	54 17.9	65 21.6	66 21.9	89 29.6	3 1.0	301 100.0
July	Crisis	617 13.8	1017 22.7	981 21.9	1070 23.9	729 16.3	69 1.5	4483 100.0
	Information	176 9.9	410 23.1	435 24.5	397 22.4	322 18.1	35 2.0	1775 100.0
	Suicide-Related	155 16.1	227 23.6	213 22.2	203 21.1	154 16.0	8 0.8	960 100.0
	Non-Crisis	43 11.9	65 18.0	74 20.4	94 17.7	85 23.5	1 0.3	362 100.0

(Table continued)

Aug	Crisis	374 9.8	872 22.8	839 22.0	875 22.9	782 20.5	77 2.0	3819 100.0
	Information	154 9.8	324 20.7	345 22.0	351 22.4	358 22.9	33 2.1	1565 100.0
	Suicide-Related	96 10.8	191 21.4	197 22.1	195 21.8	198 22.2	16 1.8	893 100.0
	Non-Crisis	29 10.2	65 22.9	59 20.8	62 21.8	64 22.5	5 1.8	284 100.0
Sep	Crisis	464 11.8	961 24.3	933 23.6	941 23.8	615 15.6	34 0.9	3948 100.0
	Information	194 10.9	399 22.5	467 26.3	403 22.7	298 16.8	13 0.7	1774 100.0
	Suicide-Related	127 14.4	212 24.0	177 20.1	202 22.9	149 16.9	15 1.7	882 100.0
	Non-Crisis	47 14.8	76 24.0	72 22.7	76 24.0	43 13.6	3 0.9	317 100.0

(Table continued)

Oct	Crisis	562 15.0	860 22.9	878 23.4	813 21.7	620 16.5	22 0.6	3755 100.0
	Information	197 13.8	347 24.3	308 21.6	320 22.4	247 17.3	9 0.6	1428 100.0
	Suicide-Related	170 17.8	217 22.7	215 22.5	226 23.6	125 13.1	4 0.4	957 100.0
	Non-Crisis	56 20.4	64 23.3	56 20.4	56 20.4	43 15.6	0 0.0	275 100.0
Nov	Crisis	373 11.0	822 24.3	793 23.5	804 23.8	567 16.8	17 0.5	3376 100.0
	Information	127 10.2	328 26.3	284 22.8	274 22.0	230 18.5	3 0.2	1246 100.0
	Suicide-Related	96 12.6	185 24.2	191 25.0	173 22.7	115 15.1	3 0.4	763 100.0
	Non-Crisis	35 11.9	66 22.5	69 23.5	81 27.6	42 14.3	0 0.0	293 100.0

(Table continued)

Dec	Crisis	468 14.3	829 25.4	734 22.5	610 18.7	563 17.3	58 1.8	3262 100.0
	Information	130 11.3	258 22.4	249 21.6	253 21.9	233 20.2	30 2.6	1153 100.0
	Suicide-Related	95 12.5	188 24.8	168 22.2	122 16.1	169 22.3	15 2.0	757 100.0
	Non-Crisis	37 13.1	67 23.8	59 20.9	61 21.6	49 17.4	9 3.2	282 100.0
Total	Crisis	5911	10654	10480	10515	7867	440	
	Information	1964	4065	4180	4071	3408	207	
	Suicide-Related	1364	2456	2322	2110	1774	95	
	Non-Crisis	454	844	854	828	694	27	

^a M = 493 crisis calls for week 1; SD = 96.8 calls; Range was 381 to 678.

M = 164 information calls for week 1; SD = 31.2 calls; Range was 127 to 222.

M = 114 suicide-related calls for week 1; SD = 27.3 calls; Range was 77 to 170.

M = 38 non-crisis calls for week 1; SD = 8.4 calls; Range was 24 to 56.

^b M = 888 crisis calls for week 2; SD = 72.4 calls; Range was 726 to 1017.

M = 339 information calls for week 2; SD = 40.5 calls; Range was 258 to 410.

M = 205 suicide-related calls for week 2; SD = 18.2 calls; Range was 167 to 224.

M = 70 non-crisis calls for week 2; SD = 11.2 calls; Range was 54 to 91.

^c M = 873 crisis calls for week 3; SD = 64.3 calls; Range was 734 to 981.

M = 348 information calls for week 3; SD = 57.7 calls; Range was 249 to 467.

(Table continued)

\underline{M} = 194 suicide-related calls for week 3; \underline{SD} = 14.1 calls; Range was 177 to 215.
 \underline{M} = 71 non-crisis calls for week 3; \underline{SD} = 11.3 calls; Range was 56 to 91.
^d \underline{M} = 876 crisis calls for week 4; \underline{SD} = 106.9 calls; Range was 610 to 1070.
 \underline{M} = 339 information calls for week 4; \underline{SD} = 44.1 calls; Range was 253 to 403.
 \underline{M} = 176 suicide-related calls for week 4; \underline{SD} = 32.5 calls; Range was 122 to 226.
 \underline{M} = 69 non-crisis calls for week 4; \underline{SD} = 11.2 calls; Range was 53 to 94.
^e \underline{M} = 656 crisis calls for week 5; \underline{SD} = 74.1 calls; Range was 563 to 787.
 \underline{M} = 284 information calls for week 5; \underline{SD} = 51.1 calls; Range was 218 to 358.
 \underline{M} = 148 suicide-related calls for week 5; \underline{SD} = 23.2 calls; Range was 113 to 198.
 \underline{M} = 58 non-crisis calls for week 5; \underline{SD} = 15.4 calls; Range was 42 to 89.
^f \underline{M} = 40 crisis calls for week 6; \underline{SD} = 20.9 calls; Range was 17 to 77.
 \underline{M} = 19 information calls for week 6; \underline{SD} = 10.7 calls; Range was 3 to 35.
 \underline{M} = 9 suicide-related calls for week 6; \underline{SD} = 4.9 calls; Range was 2 to 16.
 \underline{M} = 3 non-crisis calls for week 6; \underline{SD} = 2.8 calls; Range was 0 to 9.

Objective 3

Describe the community traumatic events and publicized suicides experienced by a metropolitan Louisiana parish (county) community during the period of January 1, 1993 to December 31, 2004 on the level of impact defined as local, regional, national, or international. In addition, each of these crises was then categorized as natural, human-made, or suicide. A total of 417 Community Traumatic Events (CTEs) were identified for the time period. On 19 of the 4,383 days in this aspect of the study, the study parish (county) sustained more than one CTE. Human made CTEs (\underline{n} = 262, 62.8%) were more common than natural made CTEs (\underline{n} = 45, 10.8%). A total of 110 (26.4) suicides were reported on the front page of the study parish's (county's) sole newspaper, qualifying as a third type of CTE. With regard to breadth of impact, 243 of the CTEs were of a local nature; 57 had a statewide impact; 13 were regional in impact; 86 of national impact and 21 of international impact. The year with the most CTEs was 2002 with the study parish (county) sustaining 63 CTEs. These 63 unique events occurred on 54 different days with 46 days having one CTE each, seven days having two CTEs each, and one day having three CTEs. The year with the least CTEs was 2000, with the study parish sustaining only 13 CTEs. Tables 16 through 19 illustrate the distributions of CTEs.

Objective 4

Determine the length of the effect of a community traumatic event on a community after the initial announcement of the event as measured by changes in the temporal distribution of suicides in a metropolitan Louisiana parish (county) from January 1, 1994 to December 31, 2004 using the temporal distributions of homicides

and accidental deaths during the same period as comparison groups. Additionally, determine the length of the effect as measured in the change in call volume to the local crisis center hotline.

To achieve this objective, several steps were taken beginning with preliminary examination of the data (adjusted for the calendar effect using the Julian Calendar adjustment) for normality, outliers, trends and stationarity. Assessing normality, each of the distributions were positively skewed (Suicide = 3.016, \underline{SE} = .039; Homicide = 2.518, \underline{SE} = .039; Accidental Death = 2.269, \underline{SE} = .039). The distributions of all three types of death appear leptokurtic; taking the standard error of the kurtosis statistic (Suicide = 9.126, Homicide = 7.468, and Accidents = 6.012) for each type of death ($\underline{SE}_{\text{Suicide}}$ = .077, $\underline{SE}_{\text{Homicide}}$ = .077, $\underline{SE}_{\text{Accidental Deaths}}$ = .077) and multiplying each by 2 to construct the range of normality (-1.54 to 1.54), the distributions approach normality because the values for kurtosis for all three types of death (Suicide = .11, Homicide = .20, and Accidental Deaths = .29) fall within the range of -1.54 to 1.54. Histograms for each type of death are presented in Figures 4 through 6. To detect extreme outliers, scatterplots were examined for each type of death. These are presented in Figures 7 through 9.

The next step in preparing to explore for patterns in the data using spectral analysis was to identify predictable trends for removal. The lagged autocorrelation in SPSS was utilized for this aspect of the objective with a minimum of 1 lag and a maximum of 16 lags using the default Box-Ljung Q Test, which tests whether sets of lagged autocorrelations (in this study up to 16) are significantly different from zero. For suicides and accidental deaths, the 16 sets of lagged autocorrelations were significant ($p < .0001$). However, for homicides, none of the 16 sets were significant. Results of

each series of lagged autocorrelations including the Box-Ljung Q Test statistic are presented in Tables 19 through 21 with the respective bar graphs of the confidence intervals for each series presented in Figures 10 through 12.

Significant results of the Box-Ljung Q Test indicate that some pattern is present in the distributions for suicides and accidental deaths. Thus, it was necessary to describe and remove these using Ordinary Least Squares Regression (OLS) before assessing stationarity and proceeding with the spectral analysis (Warner, 1998).

The necessary assumptions of normality, linearity, average error (distribution of error terms approaches normality), independence of error terms, and homoscedasticity are required for OLS. Based on analysis of histograms of suicides and accidental deaths (Figures 4 and 6), both distributions approach normality. Analyses of scatterplots (Figures 7 and 9) indicated that there was one point in each distribution that required further assessment for undue influence on the dependent variables of suicide and accidental death before a simple regression could be constructed.

Standardized residuals were computed for each of the distributions. In the suicide distribution, 165 of the observations were aberrant with values greater than the absolute value of two detecting these as potential outliers. In the accidental death distribution, 419 observations were detected as possible outliers due to standardized residuals greater than the absolute value of two. Standardized residuals for the distributions of suicides and accidental deaths were plotted and are presented in Figures 13 and 14.

Table 15

Calls Answered Per Month of the Year by Type of Call for Selected Crisis Hotline in Selected Parish (County), 1996-2004

	<u>Crisis</u>		<u>Info.</u>		<u>Suicide-Related</u>		<u>Non-Crisis</u>		<u>Total</u>	
Month	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Jan	4191	59.5	1654	23.5	874	12.4	330	4.7	7049	100.0
Feb	3746	59.9	1411	22.6	805	12.9	289	4.6	6251	100.0
Mar	3771	58.7	1423	22.2	898	14.0	327	5.1	6419	100.0
Apr	3837	58.1	1534	23.2	931	14.1	301	4.6	6603	100.0
May	3987	60.3	1401	21.2	890	13.5	339	5.1	6617	100.0
Jun	3784	58.9	1535	23.9	806	12.5	301	4.7	6426	100.0
Jul	4483	59.1	1775	23.4	960	12.7	362	4.8	7580	100.0
Aug	3819	58.2	1565	23.9	893	13.6	284	4.3	6561	100.0
Sep	3948	57.0	1774	25.6	882	12.7	317	4.6	6921	100.0
Oct	3755	58.5	1430	22.3	957	14.9	275	4.3	6417	100.0
Nov	3380	59.5	1246	21.9	763	13.4	294	5.2	5683	100.0
Dec	3262	59.8	1153	21.1	757	13.9	282	5.2	5454	100.0
Total	45963	58.9	17901	23.0	10416	13.4	3701	4.7	77981	100.0

(Table continued)

M = 3830 crisis calls; SD = 308.1 calls; Range was 3262 to 4483.

M = 1492 information calls; SD = 181.1 calls; Range was 1153 to 1775.

M = 868 suicide-related calls; SD = 66.9 calls; Range was 757 to 960.

M = 308 non-crisis calls; SD = 25.5 calls; Range was 275 to 362.

Table 16
Naturally Occurring Community Traumatic Events (CTEs) by Year Sustained in Study Parish (County), 1993-2004

Year	Number of Natural CTEs	Percentage of Total CTEs
	<u>n</u>	%
1993	1	0.2
1994	2	0.5
1995	6	1.5
1996	1	0.2
1997	2	0.5
1998	3	0.7
1999	1	0.2
2000	4	1.0
2001	3	0.7
2002	11	2.6
2003	5	1.2
2004	6	1.5
Total	45	10.6

Note. All events were identified using the front pages from newspaper archives for each day in the selected years in the study parish (county).

Table 17
Human-Made Community Traumatic Events (CTEs) by Year and Breadth of Impact
Sustained by Study Parish (County), 1993-2004

Year	Local	State	Regional	National	International
	$\frac{n}{\% \text{ of Year's CTEs}}$	$\frac{n}{\% \text{ of Year's CTEs}}$	$\frac{n}{\% \text{ of Year's CTEs}}$	$\frac{n}{\% \text{ of Year's CTEs}}$	$\frac{n}{\% \text{ of Year's CTEs}}$
1993	7 46.7	3 20.0	2 13.3	3 20.0	0 0.0
1994	9 42.9	5 23.8	0 0.0	7 33.3	0 0.0
1995	11 64.7	0 0.0	4 23.5	2 11.8	0 0.0
1996	6 42.9	2 14.3	1 7.1	3 21.4	2 14.3
1997	12 75.0	0 0.0	1 6.3	1 6.3	2 12.5
1998	3 50.0	0 0.0	0 0.0	0 0.0	3 50.0
1999	3 75.0	0 0.0	1 25.0	0 0.0	0 0.0
2000	1 33.3	0 0.0	2 66.7	0 0.0	0 0.0
2001	0 0.0	1 3.7	0 0.0	21 77.8	5 18.5
2002	12 38.7	7 22.6	0 0.0	9 29.0	3 9.7
2003	18 35.3	9 17.6	2 3.9	20 39.2	2 3.9
2004	11 30.6	10 27.8	0 0.0	12 33.3	3 8.3

(Table continued)

Total	93	37	11	78	20
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Note. All events were identified using the front pages from newspaper archives for each day in the selected years in the selected parish (county).

Table 18
Reported Suicides^a by Year Sustained by Study Parish (County), 1993-2004

Year	Number of Reported Suicides	Percentage of Total CTEs
	<u>n</u>	%
1993	16	3.8
1994	9	2.2
1995	16	3.8
1996	12	2.9
1997	9	2.2
1998	14	3.4
1999	11	2.6
2000	6	1.4
2001	4	1.0
2002	9	2.2
2003	3	0.7
2004	1	0.2
Total	110	26.4

Note. All events were identified using the front pages from newspaper archives for each day in the selected years in the selected parish (county).

^aAssisted suicides were included in this category.

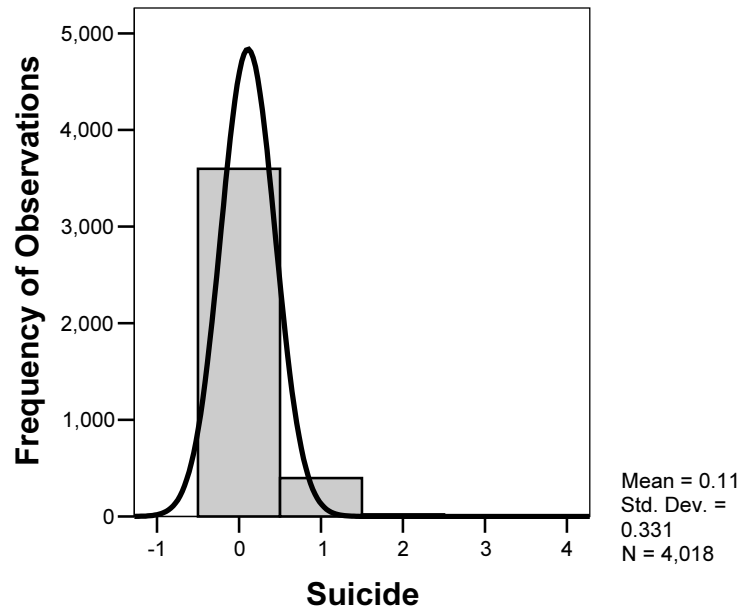


Figure 4. Histogram of Suicides in Study Parish (County) from 1994-2004.

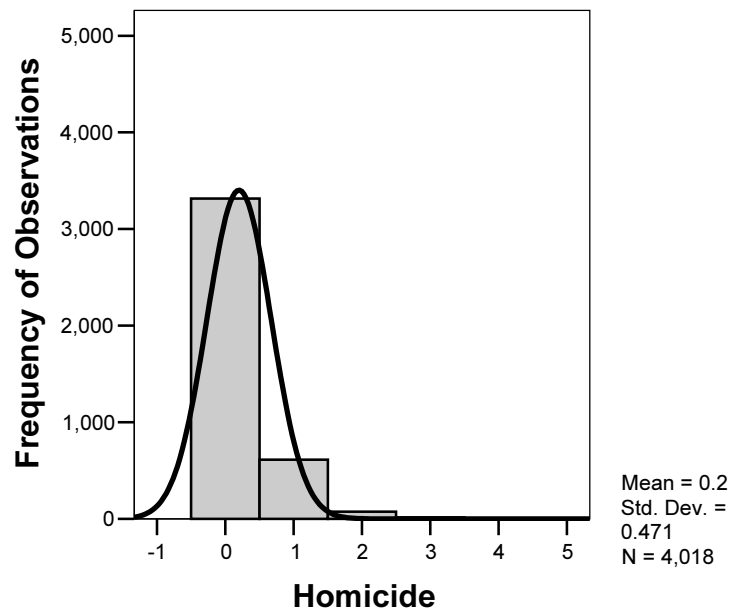


Figure 5. Histogram of Homicides in Study Parish (County) from 1994-2004.

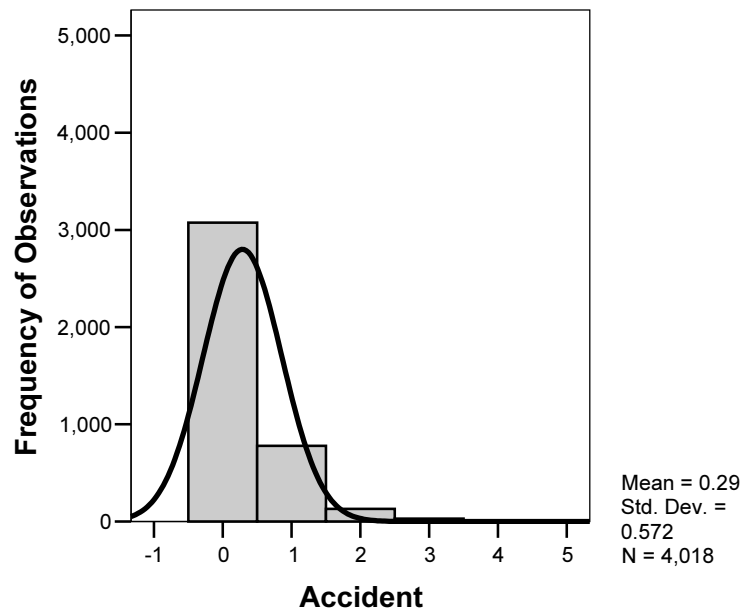


Figure 6. Histogram of Accidental Deaths in Study Parish (County) from 1994-2004.

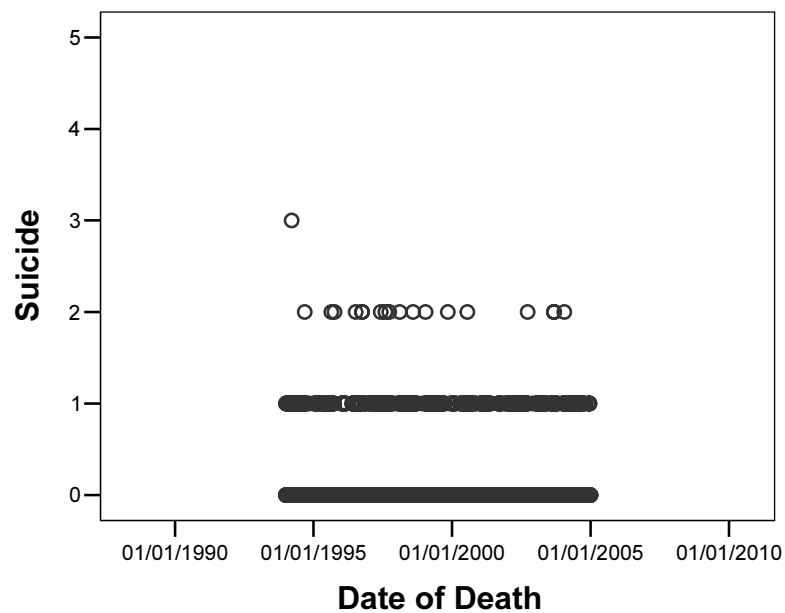


Figure 7. Scatterplot of Suicides in Study Parish (County) from 1994-2004.

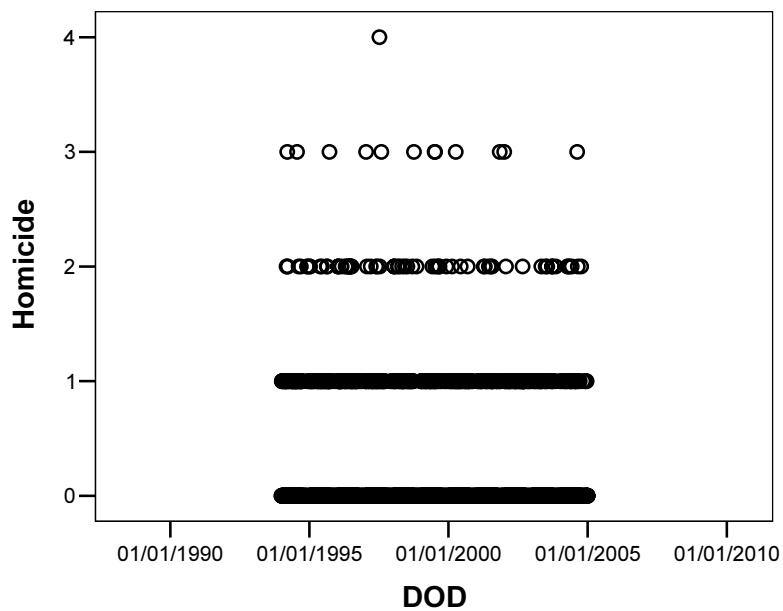


Figure 8. Scatterplot of Homicides in Study Parish (County) from 1994-2004.

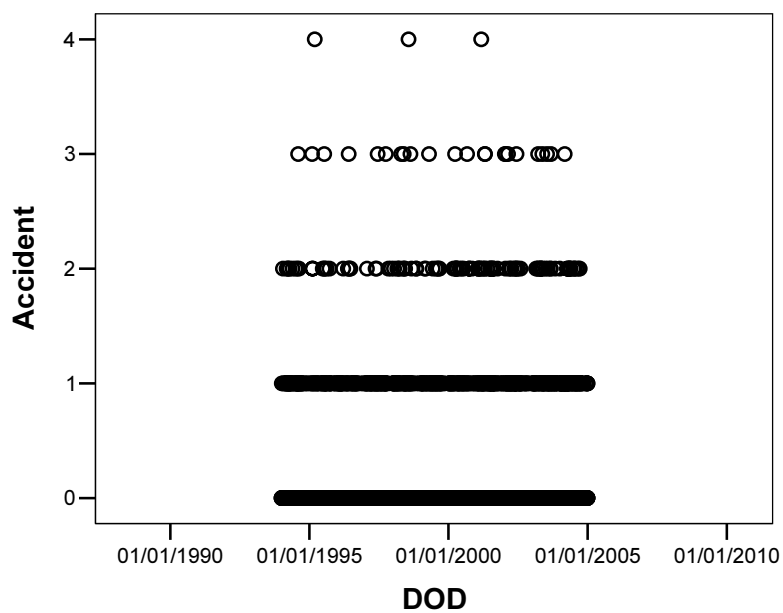


Figure 9. Scatterplot of Accidental Deaths in Study Parish (County) from 1994-2004.

Table 19
Autocorrelations and Box-Ljung Q Test Results for Suicide Distribution in Study Parish
(County), 1994-2004

Lag	Autocorrelation	Standard Error ^a	Box-Ljung Statistic	df	p ^{b, c}
1	.987	.016	3918.138	1	<.001
2	.981	.016	7787.183	2	<.001
3	.974	.016	11607.432	3	<.001
4	.968	.016	15379.182	4	<.001
5	.962	.016	19102.732	5	<.001
6	.955	.016	22778.380	6	<.001
7	.949	.016	26406.424	7	<.001
8	.943	.016	29987.164	8	<.001
9	.937	.016	33520.897	9	<.001
10	.930	.016	37007.922	10	<.001
11	.924	.016	40448.540	11	<.001
12	.918	.016	43843.050	12	<.001
13	.911	.016	47191.751	13	<.001
14	.905	.016	50494.943	14	<.001
15	.899	.016	53752.927	15	<.001
16	.892	.016	56966.003	16	<.001

^a The underlying process assumed is independence (white noise).

^b Based on the asymptotic chi-square approximation.

^c .05 alpha level.

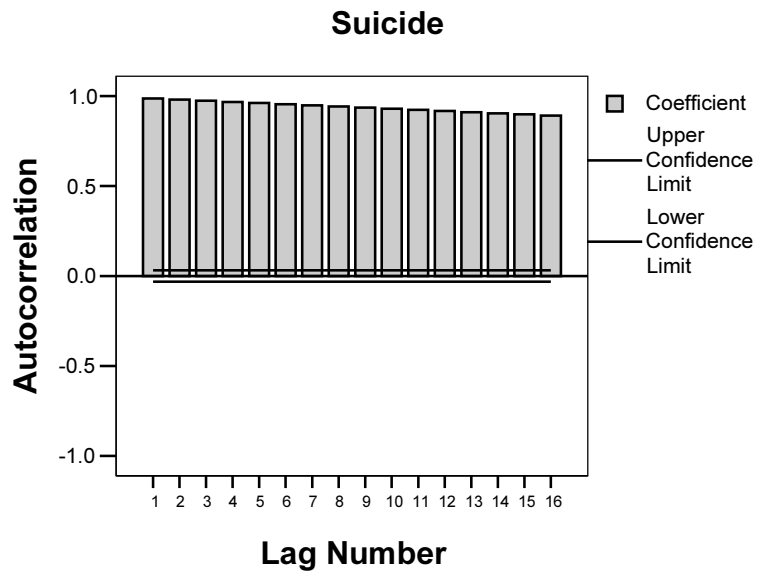


Figure 10. Histogram of Autocorrelations of Suicide Distribution in Study Parish (County) from 1994-2004.

Table 20
Autocorrelations and Box-Ljung Q Test Results for Homicide Distribution in Study Parish (County), 1994-2004

Lag	Autocorrelation	Standard Error ^a	Box-Ljung Statistic	df	p ^{b, c}
1	.009	.016	.346	1	.556
2	.024	.016	2.624	2	.269
3	.014	.016	3.376	3	.337
4	.001	.016	3.382	4	.496
5	.024	.016	5.636	5	.343
6	-.019	.016	7.086	6	.313
7	-.005	.016	7.201	7	.408
8	.023	.016	9.265	8	.320
9	-.009	.016	9.577	9	.386

(Table continued)

10	-.009	.016	9.876	10	.451
11	.025	.016	12.434	11	.332
12	-.022	.016	14.374	12	.277
13	.007	.016	14.556	13	.336
14	.011	.016	15.058	14	.374
15	.009	.016	15.392	15	.424
16	.024	.016	17.688	16	.343

^a The underlying process assumed is independence (white noise).

^b Based on the asymptotic chi-square approximation.

^c .05 alpha level.

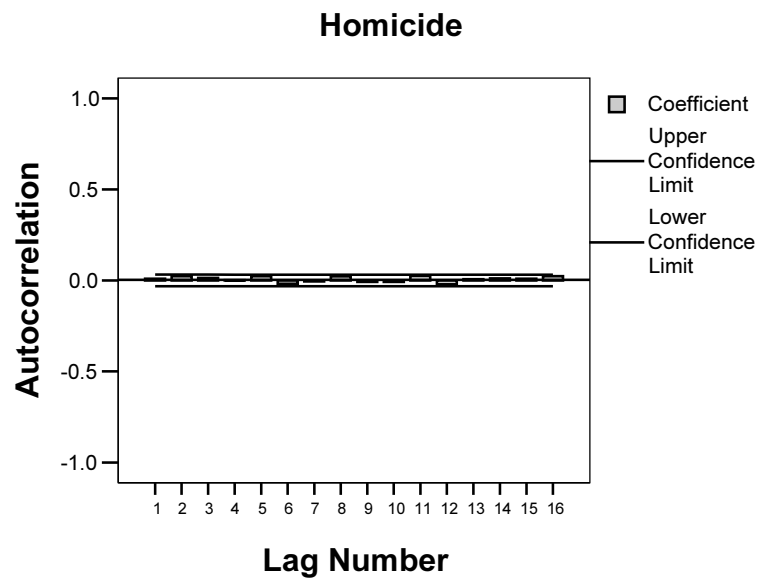


Figure 11. Histogram of Autocorrelations of Homicide Distribution in Study Parish (County) from 1994-2004.

Table 21
Autocorrelations and Box-Ljung Q Test Results for Accidental Deaths Distribution in
Study Parish (County), 1994-2004

Lag	Autocorrelation	Standard Error ^a	Box-Ljung Statistic	df	p ^{b, c}
1	.198	.016	158.064	1	<.001
2	.193	.016	308.038	2	<.001
3	.171	.016	425.679	3	<.001
4	.152	.016	518.185	4	<.001
5	.178	.016	645.932	5	<.001
6	.140	.016	724.951	6	<.001
7	.161	.016	828.754	7	<.001
8	.123	.016	890.163	8	<.001
9	.114	.016	942.793	9	<.001
10	.128	.016	1008.726	10	<.001
11	.114	.016	1061.268	11	<.001
12	.155	.016	1158.311	12	<.001
13	.106	.016	1203.543	13	<.001
14	.154	.016	1299.803	14	<.001
15	.116	.016	1353.778	15	<.001
16	.092	.016	1387.967	16	<.001

^a The underlying process assumed is independence (white noise).

^b Based on the asymptotic chi-square approximation.

^c .05 alpha level.

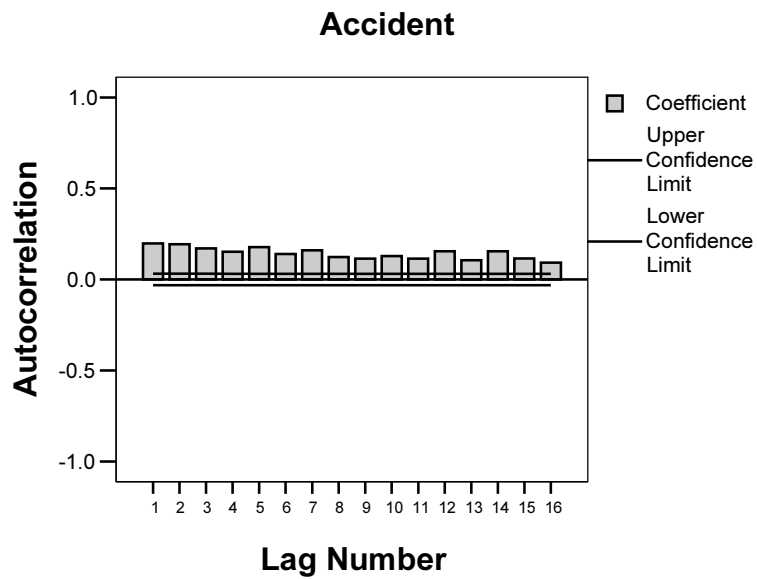


Figure 12. Histogram of Autocorrelations of Accidental Deaths Distribution in Study Parish (County) from 1994-2004.

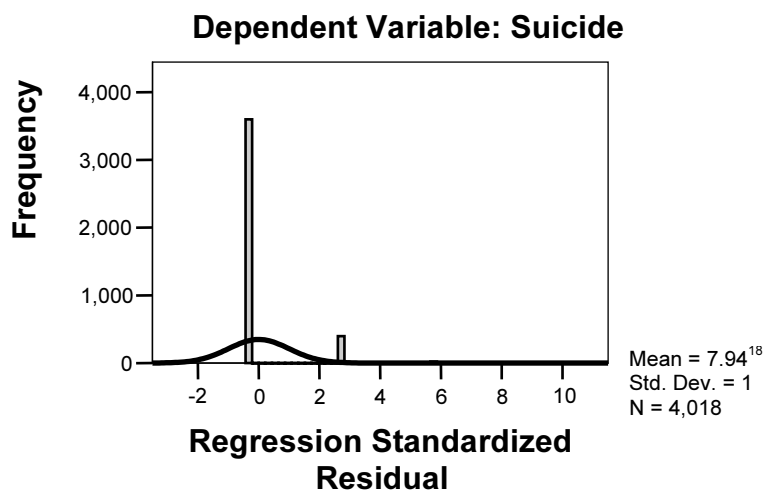


Figure 13. Histogram of Standardized Residuals of Suicide Distribution in Study Parish (County) from 1994-2004.

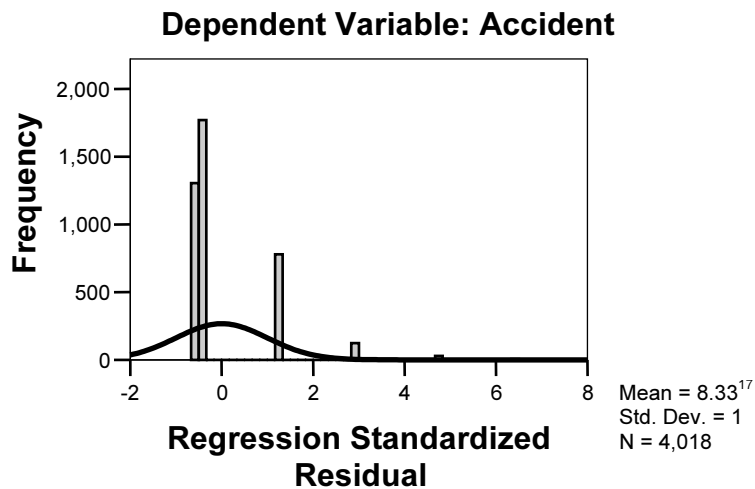


Figure 14. Histogram of Standardized Residuals of Accidental Deaths Distribution in Study Parish (County) from 1994-2004.

Before removal of these possible outliers from the suicide and accidental death distributions, further diagnostics were completed. Influence (Cook's D) and leverage (h) were assessed for both distributions to inform the researcher as to whether the possible outliers should be removed. For suicides and accidental deaths, there were no values of Cook's D greater than the absolute value of one, indicating that none of the potential outliers exerted significant influence on the dependent variable. Leverage (h) was determined to have a maximum cutoff of 9.96 for both suicides and accidents using the formula $h > 2(k+1)/n$ with k representing the number of independent variables (1) and n representing the sample size (4018). There were no cases with a leverage that was greater than 9.96. Though possible outliers were detected using standardized residuals, no observations were removed because tests for influence and leverage indicated that

these possible outliers were not exerting undue influence on the dependent variables of suicide and accidental death.

Simple regression of the suicide and accidental deaths distributions with the Julian Calendar observation date as the independent variable for each were conducted for the purpose of removing possible existing trends, which were indicated in the Box-Ljung Q Test. Pearson correlations revealed a negligible (Davis, 1971) association between suicide and observation number (in this case Julian Calendar date of death) that was not significant ($r = .007$, $p = .329$) with an R^2 of less than .001 indicating that there is little if any variance in suicide explained by the date of the observation. For accidental deaths, the initial simple regression yielded similar results with a negligible association that was not statistically significant ($r = -.003$, $p = .414$) and accounted for minute variance ($R^2 < .001$). For both regressions, the omnibus test was not significant ($F_{\text{Suicide}} = .195$, $p = .659$; $F_{\text{Accidental Deaths}} = .047$, $p = .828$).

Though the prediction lines generated and fitted from the simple regressions of both the suicide and accidental deaths were not found to be useful based on the results of the omnibus test and the independent variable accounted for little if any variance in each of the dependent variables (i.e. suicide and accidental deaths), the results of the Box-Ljung Q Test, which suggested the presence of trends in both datasets may still be tenable. As Warner (1998) emphasizes, though OLS is a viable option for trend removal prior to spectral analysis, it is also problematic as statistically significant autocorrelation among residuals may make significance testing using the F statistic invalid.

To ensure that this was not the case with the suicide and accidental death distributions in this study, the Box-Ljung Q statistic was computed for the residuals for each of the datasets. The lagged autocorrelation in SPSS was utilized for this aspect of the objective with a minimum of 1 lag and a maximum of 16 lags. For suicides, none of the 16 sets of lags were significant, supporting that the suspected trend is also not significant (based on the omnibus test and \underline{R}^2 value) and not necessary to remove. However, for accidental deaths, the 16 sets of lagged autocorrelations were significant ($p < .001$) supporting that the residuals of the regression of the accidental deaths dataset are not independent, compromising the results of the regression, specifically invalidating the \underline{F} test. Depending upon the practical importance of the trend (amount of variance explained by the \underline{R}^2 value), the description and removal of a trend prior to spectral analysis might be necessary. However, because the \underline{R}^2 value for the simple regression of the accidental deaths distribution accounted for less than a tenth of one percent of the variance in the distribution, the researcher has deemed removal of this trend unnecessary. Results of each series of lagged autocorrelations including the Box-Ljung Q Test statistic are presented in Tables 22 and 23 with the respective bar graphs of the confidence intervals for each series presented in Figures 15 and 16.

Considering that there were no significant trends to be removed prior to conducting the spectral analysis, the final preliminary step necessary to proceed with the study was to assess stationarity of the time series (i.e. are the mean, variance and lagged autocorrelations consistent over time?). Warner (1998) recommends using analysis of variance (ANOVA) as a means of testing stationarity, grouping observations in a manner logical to the dataset organization. In this study, each of the observations is

a twenty-four hour period over an 11 year time span resulting in 4,018 observations. To assess stationarity, the observations were grouped by year and one-way ANOVAs were constructed for each of the three distributions. Levene's test for homogeneity of variance was computed and none of the three distributions were found to be stationary in terms of homogeneity of variance ($F_{\text{Suicide}} = 3.829 [10, 4007], p < .001$; $F_{\text{Homicide}} = 7.977, [10, 4007], p < .001$; $F_{\text{Accidental Deaths}} = 9.432 [10, 4007], p < .001$). The heterogeneity of variance in these one-way ANOVAs was sufficient evidence for the researcher to assume violation of the assumption of stationarity necessary for spectral analysis. For this reason, the researcher abandoned the prospect of spectral analysis of the three distributions and proceeded with the study using alternate means.

As an alternate approach to determining the length of the effect of a community traumatic event on a community after the initial announcement of the event, the researcher achieved this objective using the Pearson correlation coefficient to detect the existence and strength of a relationship between the temporal distribution of the three types of deaths and the identified community traumatic events (CTEs). The Pearson correlation coefficient indicated a negligible association between each of the types of death and community traumatic events (CTEs). The coefficient was not significant for any of the three distributions. The correlation matrix is illustrated in Table 24.

Table 22

Autocorrelations and Box-Ljung Q Test Results for Residuals of Suicide Distribution in Study Parish (County), 1994-2004

Lag	Autocorrelation	Standard Error ^a	Box-Ljung Statistic	df	p ^{b, c}
1	-.021	.016	1.701	1	.192
2	-.017	.016	2.800	2	.247
3	-.010	.016	3.181	3	.365
4	.016	.016	4.230	4	.376
5	.001	.016	4.236	5	.516
6	-.001	.016	4.242	6	.644
7	.014	.016	5.034	7	.656
8	.006	.016	5.159	8	.740
9	.000	.016	5.160	9	.820
10	-.007	.016	5.368	10	.865
11	.002	.016	5.386	11	.911
12	-.014	.016	6.122	12	.910
13	.008	.016	6.410	13	.930
14	.010	.016	6.796	14	.942
15	.014	.016	7.644	15	.937
16	.002	.016	7.661	16	.958

^a The underlying process assumed is independence (white noise).

^b Based on the asymptotic chi-square approximation.

^c .05 alpha level.

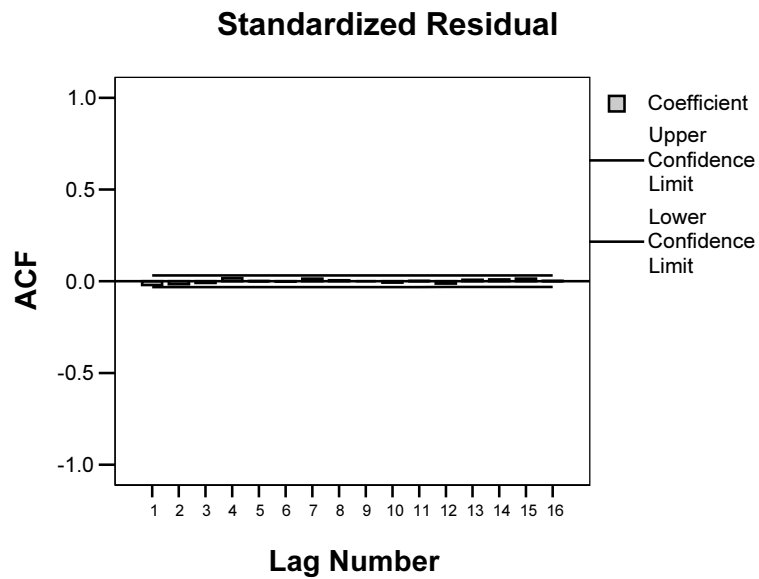


Figure 15. Histogram of Lagged Autocorrelations of Standardized Residuals of Suicide Distribution in Study Parish (County) from 1994-2004.

Table 23
 Autocorrelations and Box-Ljung Q Test Results for Residuals of Accidental Death Distribution in Study Parish (County), 1994-2004

Lag	Autocorrelation	Standard Error ^a	Box-Ljung Statistic	df	p ^{b, c}
1	.987	.016	3917.809	1	<.001
2	.981	.016	7786.606	2	<.001
3	.974	.016	11606.803	3	<.001
4	.968	.016	15378.333	4	<.001
5	.962	.016	19101.243	5	<.001
6	.955	.016	22776.301	6	<.001

(Table continued)

7	.949	.016	26403.521	7	<.001
8	.943	.016	29983.505	8	<.001
9	.936	.016	33516.537	9	<.001
10	.930	.016	37002.939	10	<.001
11	.924	.016	40443.052	11	<.001
12	.917	.016	43837.200	12	<.001
13	.911	.016	47185.687	13	<.001
14	.905	.016	50488.789	14	<.001
15	.899	.016	53746.823	15	<.001
16	.892	.016	56959.987	16	<.001

^a The underlying process assumed is independence (white noise).

^b Based on the asymptotic chi-square approximation.

^c .05 alpha level.

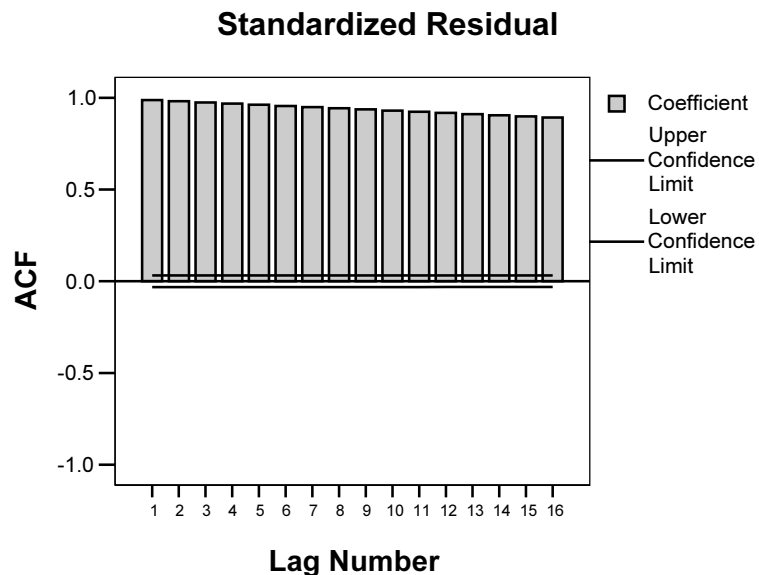


Figure 16. Histogram of Lagged Autocorrelations of Standardized Residuals of Accidental Deaths Distribution in Study Parish (County) from 1994-2004.

Table 24
Correlations Between Types of Death and Community Traumatic Events (CTE)

		Suicide (<u>n</u> = 4018)	Homicide (<u>n</u> = 4018)	Accidental Deaths (<u>n</u> = 4018)
Community Traumatic Events (CTE)	Pearson Correlation (r)	.014	-.001	-.014
	<u>P</u>	.387	.956	.375

Objective 5

Determine if a model exists explaining a significant portion of the variance in per capita suicide rate following community traumatic events from selected societal and personal demographic characteristics. Because a sufficiently significant and sizeable correlation was not identified between the distribution of death and CTEs, this objective was not attempted.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Purpose and Objectives

The primary purpose of this study was to determine if a relationship exists between community traumatic events (CTE) such as the September 11, 2001 terrorist attacks and Hurricanes Katrina and Rita and the temporal distribution of suicide in a Louisiana parish (county) in the Southern United States over the time period of January 1, 1994 to December 31, 2004. The specific objectives investigated in this study were to:

1. Describe individuals who died by suicide in a metropolitan Louisiana parish (county) from January 1, 1994 to December 31, 2004 on the selected characteristics of:
 - a. Age
 - b. Gender
 - c. Race
 - d. Method of death
 - e. Date of birth
 - f. Date of death

For comparison groups, people who died by homicide and accident during the time period were described on the same characteristics. Additionally, calls to the area's American Association of Suicidology certified crisis intervention center's 24-hour crisis hotline between January 1, 1994 and December 31, 2004 were

described on the selected characteristics of age of caller, gender of caller, race of caller, type of call, and date of call.

2. Describe and compare the temporal distribution of suicides in a metropolitan Louisiana parish (county) from January 1, 1994 to December 31, 2004 with the temporal distributions of homicides and accidental deaths during the same period, exploring for trends on the variables day of the week of death, week of the month of death, and month of the year of death. Additionally, describe the distribution of calls to the local crisis center hotline on the variables of day of the week, week of the month, and month of the year.
3. Describe the community traumatic events and publicized suicides experienced by a metropolitan Louisiana parish (county) community during the period of January 1, 1993 to December 31, 2004 on the level of impact defined as local, regional, national, or international. In addition, each of these crises was then categorized as natural, human-made, or suicide.
4. Determine the length of the effect of a community traumatic event on a community after the initial announcement of the event as measured by changes in the temporal distribution of suicide and changes in the volume of suicide-related calls to the local crisis hotline.
5. Determine if a model exists explaining a significant portion of the variance in the per capita suicide rate following community traumatic events from selected societal and personal demographic characteristics.

Procedures

There were two samples used in this study. One consisted of people who died by suicide in the selected Louisiana parish (county) from January 1, 1994 to December 31, 2004 whose deaths were investigated by the parish (county) coroner. Comparison groups for this sample consisted of people who died between January 1, 1994 and December 31, 2004 in the selected parish (county) either by homicide or accident and whose deaths were investigated by the parish (county) coroner. A total of 2,399 deaths were included for analysis with 442 suicides (18.4%), 809 homicides (33.7%), and 1,148 accidents (47.9%).

The second sample was of calls received by the American Association of Suicidology (AAS) certified crisis hotline in the selected parish during the time period of January 1, 1994 to December 31, 2004. Records for January 1, 1994 through December 31, 1995 were not available. A total of 77,986 of the 149,724 calls answered from January 1, 1996 through December 31, 2004 were included in this study.

The coroner's office for the selected parish (county) is the responsible entity for investigating all reported suicides, homicides, and accidental deaths in the parish (county). The researcher obtained permission from the coroner's office to collect data on deaths investigated from January 1, 1994 to December 31, 2004. A researcher designed recording form was created and used to collect data for the sample of deaths investigated by the parish's (county's) coroner's office during the selected period. The objectives of the study served as the basis for selection of items to include in the instrument including the variables of identification number, reported age of deceased, gender of deceased, race of deceased, date of death, method of death, and type of

death for suicides, homicides, and accidents. An additional variable, date of birth, was requested from the selected parish's (county's) coroner's office during the initial meeting in 2003 and was released to the researcher for suicide victims only who died from January 1, 1994 through September 23, 2003. The remainder of the birthdates for victims dying by suicide between September 24, 2003 and December 31, 2004 was requested in early 2005. By 2005, a new coroner had been elected and permission was not granted to obtain the birth dates for victims of suicide from September 24, 2003 through December 31, 2004.

For the sample of calls made to the AAS certified crisis hotline serving the parish (county), the executive director of the crisis intervention center managing the hotline authorized the use of call data on calls answered by the hotline during the 11 year period of investigation. In retrieving this data, it emerged that the crisis center would only be able to provide data for 1996 through 2004. A separate recording form was created by the researcher including the variables: age of caller, gender of caller, race of caller, date of call, and type of call.

Community traumatic events (CTE) experienced by residents of the selected parish (county), both natural and human made, were identified for the 11 year period of interest. These CTEs were identified by initial date of announcement to the parish (county) through the major local newspaper. A recording form was developed by the researcher to identify initial date of announcement, whether the CTE was a suicide, assisted suicide, human-made or natural-made event and whether the CTE was local, state, regional, national or international in breadth of impact. The content of this recording form was validated by the co-chairs of this doctoral dissertation committee.

For identification and classification decisions about CTEs, a decision flowchart was developed and content validity was established by the researcher and the dissertation co-chairs. Inter-rater reliability was established between the researcher and a co-chair at a level of 97%.

Summary of Findings

Objective 1

Death Data

Findings of objective one indicated that the majority of deaths by suicide fell into the age categories “15-24 years old” ($n = 89$, 20.1%), “25-34 years old” ($n = 98$, 22.2%), and “34-45 years old” ($n = 92$, 20.8%). Similarly, the same clustering of ages in these three sequential categories was observed for homicides (“15-24 years old” [$n = 288$, 35.6%], “25-34 years old” [$n = 229$, 28.3%], and “34-45 years old” [$n = 155$, 19.2%]) and accidental deaths (“15-24 years old” [$n = 249$, 21.7%], “25-34 years old” [$n = 192$, 16.7%], and “34-45 years old” [$n = 188$, 16.4%]).

The second variable of interest for objective one was gender with males accounting for the majority of deaths in all three categories (Suicide [$n = 348$, 78.7%], Homicides, [$n = 645$, 79.7%], and Accidental Deaths [$n = 792$, 69.0%]).

Among those who died by suicide, the majority were White ($n = 346$, 78.3%). The majority of homicide victims were Black ($n = 671$, 82.9%). Within the accidental deaths category, 684 (59.6%) victims were White and 454 (39.5%) were Black.

For suicide ($n = 303$, 68.6%) and homicide ($n = 631$, 78.0%) victims, the most common method was gunshot wound; the majority of victims of accidental death died in a vehicular-related accident ($n = 718$, 62.5%).

Date of birth was the fifth variable used to describe the people who suicided in the selected parish (county) during the period of investigation. For this shortened period (January 1, 1994 to September 23, 2003), the selected parish's (county's) coroner's office recorded 399 suicides with 15 of these records missing dates of birth. Of these victims ($n = 384$), a total of 22 (10.0%) died in close temporal proximity to their dates of birth (within 10 days before or after the date of birth).

The date of death for each victim was obtained through the selected parish's (county's) coroner's office. The selected parish (county) experienced an average of 40 suicides per year ($SD = 5.9$), 74 homicides per year ($SD = 13.6$), and 104 accidental deaths per year ($SD = 18.5$) over the 11 year study period. The year 1997 had the most suicides; 1994 had the most homicides, and 2003 had the most accidental deaths.

Calls to the Local Crisis Intervention Center Hotline

Females ($n = 52,750$, 67.6%) accounted for a majority of the calls to the hotline. By type of call, females represented more than half of the callers within each call type. Among "Crisis" call records, females placed the majority of calls ($n = 30,980$, 67.4%). "Suicide-related" calls were also placed more by women ($n = 6821$, 65.5%) than men ($n = 3428$, 32.9%). The majority of "Information" calls were placed by females also ($n = 12,743$, 71.2%) and for "Non-crisis" calls, females accounted for 59.6% of callers ($n = 2,206$).

"Crisis" calls accounted for the majority of calls answered ($n = 45,963$, 58.9%). Callers seeking information (e.g. community resources) accounted for 23% ($n = 17,901$) of the calls included in this study. "Suicide-Related" calls accounted for 13.4% of calls

answered by the crisis hotline ($n = 10,416$). Finally, 3,701 calls were of a “Non-Crisis” nature, accounting for 4.7% of calls included in the study.

Focusing on the calls that qualified for inclusion in this objective, the crisis hotline answered an average of 8,665 calls per year ($SD = 1453.6$) during the study period. Of the 77,981 calls included in the analysis, an average of 5,107 “Crisis” calls ($SD = 881.6$), 1,989 “Information” calls ($SD = 376.2$), 1,157 “Suicide-Related” calls ($SD = 261.4$), and 411 “Non-Crisis” calls ($SD = 66.3$) were answered per year.

Objective 2

Death Data

Findings of objective 2 indicate that Friday was the most common day for suicides during the 11 year study period. For homicides and accidental deaths, Saturday was the most common. The week of the month most common for suicides was the fourth week as was the case with accidental deaths. Homicides were more common during weeks two and three. July was the most common month of the year for both suicides and homicides but accidental deaths were most common in December.

Calls to the Local Crisis Intervention Center Hotline

During the nine year period analyzed for this objective, January 1, 1996 through December 31, 2004, the majority of calls were answered on Mondays and Tuesdays ($n = 12,612$, 16.2% and $n = 12,199$, 15.6% respectively). The least popular days for calls to the crisis center hotline were Saturdays and Sundays ($n = 9,572$, 12.3% and $n = 9,266$, 11.9% respectively). By call type, Mondays were the most popular day on average for “Crisis” calls ($M = 796$, $SD = 163.9$), “Information” calls ($M = 371$, $SD = 72.8$), and “Non-

crisis” calls (\underline{M} = 62, \underline{SD} = 17.6). “Suicide-related” calls were most common on Tuesdays (\underline{M} = 765, \underline{SD} = 356.1).

The most common week of the month for “Crisis” calls and “Suicide-related” calls was week two (\underline{M} = 888, \underline{SD} = 72.4 and \underline{M} = 205, \underline{SD} = 18.2, respectively); for “Information” and “Non-crisis” calls, it was week three (\underline{M} = 348, \underline{SD} = 57.7 and \underline{M} = 71, \underline{SD} = 11.3, respectively).

The month of July was the most popular for calls (\underline{n} = 7,580, 9.7%). The least popular month for calls to the crisis center hotline was December (\underline{n} = 5,454, 7.0%). Specifically, for all four types of calls, “Crisis” calls, “Information” calls, “Suicide-Related” calls, and “Non-crisis” calls, July was the most popular month (\underline{n} = 4,483, 59.1%; \underline{n} = 1,775, 23.4%; \underline{n} = 960, 12.7%; and \underline{n} = 362, 4.8% respectively). December was the least popular month for “Crisis” calls (\underline{n} = 3,262, 59.8%), “Information” calls (\underline{n} = 1,153, 21.1%), and “Suicide-related” calls (\underline{n} = 757, 13.9%). For “Non-crisis” calls, October was the least popular month (\underline{n} = 275, 4.3%).

Objective 3

For this objective, a total of 417 Community Traumatic Events (CTEs) were identified for the time period of January 1, 1993 through December 31, 2004. On 19 of the 4,383 days in this aspect of the study, the study parish (county) sustained more than one CTE. Human made CTEs (\underline{n} = 262, 62.8%) were more common than natural made CTEs (\underline{n} = 45, 10.8%). A total of 110 (26.4) suicides were reported on the front page of the study parish’s (county’s) sole newspaper, qualifying as a third type of CTE. With regard to breadth of impact, 243 of the CTEs were of a local nature; 57 had a statewide impact; 13 were regional in impact; 86 of national impact and 21 of international impact.

The year with the most CTEs was 2002 with the study parish (county) sustaining 63 CTEs. These 63 unique events occurred on 54 different days with 46 days having one CTE each, seven days having two CTEs each, and one day having three CTEs. The year with the least CTEs was 2000, with the study parish sustaining only 13 CTEs.

Objective 4

This objective indicated that there was not a significant pattern present in the data to assess the length of an effect of a CTE on the community of study. The data were adjusted for the calendar effect by converting the dates to the Julian Calendar. The necessary assumptions for spectral analysis were assessed (normality, identification and removal of trends, identification and removal of influential outliers, and stationarity). The three distributions were positively skewed (Suicide = 3.016, SE = .039; Homicide = 2.518, SE = .039; Accidental Death = 2.269, SE = .039) and approached normality because the values for kurtosis for all three types of death (Suicide = .11, Homicide = .20, and Accidental Deaths = .29) fall within the range of -1.54 to 1.54.

The lagged autocorrelation function in SPSS 13.0 Trends was utilized with a minimum of 1 lag and a maximum of 16 lags using the default Box-Ljung Q Test to assess whether there were predictable trends in the data. For suicides and accidental deaths, the 16 sets of lagged autocorrelations were significant ($p < .0001$) indicating that some trend may have been present. However, for homicides, none of the 16 sets were significant indicating white noise only.

The indication of trends in suicide and homicide distribution necessitated further description and removal of these predictable trends prior to spectral analysis. Ordinary Least Squares Regression (OLS) was used for this purpose and for identification and

removal of influential outliers. Pearson correlations revealed a negligible (Davis, 1971) association between suicide and observation number (in this case Julian Calendar date of death) that was not significant ($r = .007$, $p = .329$) with an R^2 of less than .001 indicating that there is little if any variance in suicide explained by the date of the observation. For accidental deaths, the initial simple regression yielded similar results with a negligible association that was not statistically significant ($r = -.003$, $p = .414$) and accounted for minute variance ($R^2 < .001$). For both regressions, the omnibus test was not significant ($F_{\text{Suicide}} = .195$, $p = .659$; $F_{\text{Accidental Deaths}} = .047$, $p = .828$).

Because it is possible that statistically significant autocorrelation among residuals may make significance testing using the F statistic invalid, the Box-Ljung Q statistic was computed for the residuals for each of the datasets indicating that the omnibus test was valid for suicide data but not for accidental death data with the 16 sets of lagged autocorrelations being significant ($p < .001$). However, because the R^2 value for the simple regression of the accidental deaths distribution accounted for less than a tenth of one percent of the variance in the distribution, the researcher has deemed removal of this trend unnecessary. During this process, outliers were also assessed for leverage and influence. Because none of the outliers exerted sufficient leverage and/or influence on the regression, no outliers were removed.

The final step necessary prior to a spectral analysis is checking for stationarity of the data. The data did not meet homogeneity of variance within any of the three distributions ($F_{\text{Suicide}} = 3.829$ [10, 4007], $p < .001$; $F_{\text{Homicide}} = 7.977$, [10, 4007], $p < .001$; $F_{\text{Accidental Deaths}} = 9.432$ [10, 4007], $p < .001$) and thus the spectral analysis was aborted.

Objective 5

Considering the termination of the spectral analysis, the researcher achieved this objective using the Pearson correlation coefficient to detect the existence and strength of a relationship between the temporal distribution of the three types of deaths and the identified community traumatic events (CTEs). The Pearson correlation coefficient indicated a negligible association between each of the types of death and community traumatic events (CTEs). The coefficient was not significant for suicide ($r = .014$, $p = .387$), homicide ($r = -.001$, $p = .956$), or accidental deaths ($r = -.014$, $p = .375$).

Conclusions, Implications, and Recommendations

Conclusion 1

The distribution of suicides studied was descriptively similar to what is observed nationally in terms of age, gender, race, and method. Youth suicide and elderly suicide are the two largest concentrations by age of suicide in the U.S. This concentration of youth suicide was present in the study parish (county) but the elderly concentration was not. Nationally, it is observed that men die by suicide four times more often than women. In this parish's (county's) 11 year long sample of suicides, the same phenomenon was observed ($n_{\text{Males}} = 348$, 78.7%; $n_{\text{Females}} = 94$, 21.3%). Nationally, White people die by suicide more often than any other race (Maris, Berman, & Silverman, 2000). The same was noted in the study parish (county) ($n_{\text{White}} = 346$, 78.3%; $n_{\text{Black}} = 90$, 20.4%; $n_{\text{Other}} = 6$, 1.4%). Both nationally and in the parish (county) of interest, the most common method of death for suicide was gunshot wound. However, the study parish (county) differed on the ratio of suicides to homicides. Nationally, suicides outnumber homicides by a third (Goldsmith et al., 2002). In the study parish

(county), homicides ($n = 809$) occurred almost twice as often as suicides ($n = 442$) during the time span studied.

Conclusion 2

Death Data

The temporal distribution of suicide was descriptively dissimilar in the study parish (county) to the distribution noted nationally and internationally. This included that both nationally and internationally, Monday is noted as the most common day for suicides (Lester, 1979; MacMahon, 1983; Maldonado & Kraus, 1991; Massing & Angermeier, 1985; Phillips & Ryan, 2000) while in this study, Friday ($M = 7$, $SD = 2.3$) was the most common day for suicides during the 11 years studied. Also, nationally and internationally, suicides seem to peak in April and May (Lester, 1971; Lester & Frank, 1988; Massing & Angermeier, 1985) though in this study, the peak was noted in the month of July ($M = 5$, $SD = 2.1$). A final difference noted in the description of the temporal distribution of suicide in the parish (county) of interest was that the most common week of the month for suicides was week four ($M = 10$, $SD = 3.6$) whereas Phillips and Ryan (2000) have identified that suicide declines around this time nationally.

Calls to the Local Crisis Intervention Center Hotline

Over the nine year period available (January 1, 1996 to December 31, 2004) for study of calls to the local American Association of Suicidology (AAS) certified crisis intervention center hotline, the majority of calls were answered on Mondays and Tuesdays ($n = 12,612$, 16.2% and $n = 12,199$, 15.6% respectively). The least popular days for calls to the crisis center hotline were Saturdays and Sundays ($n = 9,572$, 12.3%

and $\underline{n} = 9,266$, 11.9% respectively). Taken together, considering that inherent in the mission of the AAS certified crisis hotline is providing suicide and crisis intervention, the distribution of calls seems counterintuitive to what is noted in the distribution of suicides. Focusing in on call type, Mondays were the most popular day on average for “Crisis” calls ($\underline{M} = 796$, $\underline{SD} = 163.9$) and “Suicide-related” calls were most common on Tuesdays ($\underline{M} = 765$, $\underline{SD} = 356.1$). Given the prevalence of suicides on Friday in the parish (county) served, it is disconcerting that call volume does not follow the same pattern. Differences are also observed with regard to the most common week of the month which for “Crisis” calls and “Suicide-related” calls was week two ($\underline{M} = 888$, $\underline{SD} = 72.4$ and $\underline{M} = 205$, $\underline{SD} = 18.2$, respectively) whereas for deaths by suicide, it was week four ($\underline{M} = 10$, $\underline{SD} = 3.6$). However, call volume and concentration of deaths by suicide in terms of most popular month was consistently found to be July ($\underline{n}_{\text{Total Calls}} = 7,580$, 9.7%; $\underline{n}_{\text{Crisis Calls}} = 4,483$, 59.1%; $\underline{n}_{\text{Suicide-Related Calls}} = 960$, 12.7%).

Based on these conclusions, a recommendation for the suicidology community is to promote resurgence in research on crisis hotlines which has declined considerably since hotlines emerged in the 1960s and 1970s. Additional recommendations include further investigation of activities of the local crisis hotline. This crisis hotline is housed in a crisis intervention center which also provides the Local Outreach to Suicide Survivors (LOSS) program. This service links the crisis center to a majority if not all of the reported suicides in the parish (county) of interest for this study. The crisis intervention center has within its capabilities, the ability to review LOSS records and call records to see if over the nine year period studied (1996-2004) suicides have linked to “Crisis” or “Suicide-Related” calls to gain insight (though it is unlikely that this would be conclusive)

as to whether the people dying by suicide are calling the hotline or are so different in psychosocial characteristics that they are not utilizing this service. If few links are found between suicides and the crisis center hotline, psychological autopsies with suicide survivors are recommended to increase knowledge of what psychosocial characteristics of those who died by suicide are different than those who reach out to the crisis hotline for suicide or crisis intervention.

Conclusion 3

Descriptively, patterns were identifiable in this study within the temporal distribution of suicide such as Fridays being the most common days for suicides and July the most common month. These types of patterns, identified using descriptive statistics, have been a subject of suicide research since before Durkheim's landmark piece, *Le Suicide* [*Suicide: A Study in Sociology*] (1897/1951/1979), with a "seasonality" of suicide, first proposed by Morselli in 1881. This focus has continued to be addressed well into late 20th century research (e.g. Barraclough, & White, 1978; Eastwood & Peacocke, 1976; Lester, 1971, 1979; Lester & Frank, 1988; MacMahon, 1983; Maldonado & Kraus, 1991; Massing & Angermeier, 1985; Meares, Mendelsohn, & Milgrom-Friedman, 1981; Micciolo, Zimmermann-Tansella, Williams, et al., 1989; Nayha, 1982, 1983; Parker & Walter, 1982).

In the more recent literature, questions have been raised about the rigor of these past studies (e.g. Hakko et al., 2002) in terms of two main issues: the incompleteness of the methodology compromising sound replication, and the inappropriateness of statistical tests employed such as not accounting for the inherent order of the data (e.g. this problem arises in using a student's t-test or Chi Square test) and not adjusting for

the calendar effect (Hakko et al., 2002). Currently, a reexamination by researchers in current literature (e.g. Ho et al., 1997; Yip et al., 1998; Yip et al., 2000), using more appropriate statistical techniques as recommended by Hakko et al. (2002), indicates a “disappearance” of the seasonal effect. These recommendations from Hakko et al. were used as the primary guide in designing this study. The results of this study, trends explaining less than one tenth of a percent of the variance in the distribution of suicide, support current researchers’ findings (e.g. Ho et al., 1997; Yip et al., 1998; Yip et al., 2000) that seasonality is accounting for less and less of the variance in the temporal distribution of suicide. In fact, in the distribution of this study, patterns are not stronger than those that would be expected due to chance alone.

Two questions arise: (1) given the issues in statistical rigor, was there ever a sizeable seasonal effect in suicide distributions? And (2) if there was, why is it disappearing? Perhaps the answer to the first question is nested in the response to the second. In their research, Yip et al. (2000) propose that this “disappearing” effect of seasonality may be due to an increased connectedness among people due to advances in communication including mobile phones, email, and the internet. Returning to Durkheim’s theory presented in *Le Suicide* [*Suicide: A Study in Sociology*] (1897/1951/1979) of why a seasonal effect may have existed, many of the proposed contributing factors are no longer of consequence. Durkheim posited two main patterns and an explanation for both. He noted a “law” of suicide for all European countries: *“Beginning with January inclusive, the incidence of suicide increases regularly from month to month until about June and regularly decreases from that time to the end of the year”* (p. 111). He also noted that suicides, in Europe, were fairly consistent Monday

through Thursday then decreased on Friday cycling to the consistency of Monday through Thursday again. For both of these patterns, Durkheim conjectured that the contributing factor was differences in activity with times of increased activity and decreased social interaction having increased rates of suicide, and likewise, weekends, when social interaction was increased with rest, having fewer suicides. He used the increased rest during winter to explain the decrease in suicides noted in the winter times as well.

Focusing on current culture, given advances in technologies for warming and cooling homes, workplaces, and vehicles used for transportation, there is not a noticeable difference in activity based on weather patterns. Winters tend to be as active as any other time of the year, primarily due to the move from an agrarian economy to an industrialized and now post-industrialized economy. Additionally, and perhaps of more consequence, the economy is becoming more and more service-driven, increasing social interactions. Finally, as Yip et al. (2000) propose the increased connectedness among people due to advances in communication including mobile phones, email, and the internet also reduces the likelihood of the seasonal effect as explained by Durkheim.

An integral recommendation for this conclusion is that this aspect of the study, namely using spectral analysis to assess whether a seasonal effect is present, be replicated on a national level in the United States. Expanding this replication to a national level will increase the sample size and decrease the possibility of making a type I error in analyses.

This key recommendation cannot stand alone. There are two other issues recommended for address that must be rectified prior to achieving the replication

recommendation: surveillance and database design. Underreporting and differences among countries in reporting procedures are still issues internationally (WHO, 2003) and in the U.S., underreporting and discrepancies among states and within states continue to impede effective surveillance of suicide rates (Goldsmith et al., 2002). Additionally, database design for this surveillance is crucial in facilitating these types of studies. The issues encountered in this study are not unique to it. Suicides and other coroner investigated deaths are often recorded in an event-based structured database (where each death is an event) rather than a time-based database with each observation being a 24-hour day. Though spectral analyses can be conducted on event-based data (Warner, 1998), it is not advisable in this case as it would, as in previous studies (Hakko et al., 2002), not take into account the inherent order present in time-series data. A final issue in database design is that of coding structure. The variable “Method of Death” was not as concisely coded as it could have been as shown in the transformation of the variable employed in this study (Appendix B).

A final recommendation under this conclusion relates to supplementing these studies with investigations into the distribution of calls to a local crisis hotline. The same recommendation for database design applies as calls are also recorded as event-based data rather than time-based. Coding was also an issue given the over 130 “unique” call codes used to categorize call type in the crisis center call database. This variable was not as concisely coded as it could have been as shown in the transformation of the variable employed in this study (Appendix C).

Conclusion 4

Once the possibility of patterns in the data (whether due to seasonality or effects of community traumatic events [CTE]) was ruled out, Pearson's Correlation Coefficient was used to detect whether a statistically significant relationship existed between the distribution of suicide and the occurrences of CTEs identified in this study as impacting the selected parish (county). Relationships were not detected indicating that the occurrences of CTEs have no impact on the distribution of suicide in the selected parish (county). This has several implications significant to the progress of suicide prevention efforts.

1. The Werther Effect: A total of 110 suicides were reported on the front page of the sole newspaper in the selected parish (county). Given research on the Werther Effect, one would expect to find increases in suicide after each of these reported suicides beyond what would be expected by chance (Philips & Lesyna, 1995). However, this was not the case in this study as statistically significant increasing or decreasing patterns were not identified nor was a correlation found between the occurrences of CTEs and the distribution of suicide.
2. Clustering or Contagion: Though there were several days where more than one suicide occurred and several sequential days where more than one suicide occurred each day, statistically significant increasing or decreasing patterns were not identified. This indicates that clustering or contagion is not occurring in this dataset.

The lack of both of these phenomena in this study can be explained by the same reasoning given for the “disappearance” of a seasonal effect in suicide distributions. As noted, Durkheim (1897/1951/1979) posited that suicide is a function of social interaction patterns and the culture of the area, specifically the lack of social interaction or its decrease due to issues such as inclement weather. This social connectedness, what Durkheim termed social integration, has long been found to be a protective factor against suicide. As noted by Yip et al. (2000), current advances in communication contribute to social integration and social interaction, increasing belongingness, another protective factor against suicide (e.g. Greening & Stoppelbein, 2002; Marion & Range, 2003; McKeown, et al., 1998; Portes et al., 2002; Speice et al., 2004). Focusing specifically on CTEs, the findings in this study support Joiner’s (2004) theory that the rallying together and increased belongingness felt during times of community and national crisis actually help to protect against suicide.

However, a cautionary statement is warranted here. The CTEs which qualified for inclusion in this study were not of as an intense or catastrophic a nature as events such as the September 11, 2001 terrorist attacks were for New York, the Oklahoma City Bombing was for that area, Hurricane Andrew was for Florida, or what the Columbine tragedy was for Columbine, Colorado. This study encompasses a time series that ends shortly before two devastating events were sustained by the parish (county) of interest: Hurricanes Katrina and Rita of 2005. It still remains unknown as to whether events so directly impacting the area on such a catastrophic level would have a statistically significant impact on suicide distribution in the area.

There are a few recommendations in order for this final conclusion. The first and most important is that suicide prevention efforts be ongoing. Activities such as informing the media of responsible ways to cover suicides (to prevent the Werther Effect) when a suicide occurs, advertising crisis intervention services after a crisis or suicide, providing postvention services to schools after a youth suicide, and facilitating postvention services after suicides to families of those who have died by suicide (such as the LOSS team) are vital and necessary. Yet, these services are too reactionary in nature. Prevention efforts must be aimed at all members of a community during all times (a.k.a. primary or universal levels of prevention). In fact, as Durkheim (1897/1951/1979) and Joiner (2004) propose and as this study corroborates, times of crisis may be less “worthwhile” times for offering prevention services as times of “normalcy” (i.e. times absent of a crisis).

However, because there is still not enough evidence to support these theories that post-crisis times are more protective against suicide due to social integration or belongingness than others, a major recommendation is to expand the efforts to investigate this particular theory. As recommended previously, replication of this study on a national level is necessary in furthering the empirical knowledge base. There are two sub-recommendations regarding this particular conclusion:

1. If seasonality is found in the national replication, a random sample of communities should be selected for replication of the CTE investigative aspect of this study. As noted, it is crucial that the researcher have firsthand knowledge of a community in identifying CTEs that may be of significant impact for that community. For this reason, national replication will require collaboration. A

random sampling of communities would allow the principal investigator of this national replication to identify and train people in each community to identify CTEs for the study to be used in the analyses.

2. Because it is still unclear as to whether the CTEs experienced by this community (study parish [county]) were of substantial impact to detect a shift in the temporal distribution of suicide, this study should be expanded to include a similar parish [county], also affected by Hurricanes Katrina and Rita, and to include the year of these events and the year following (i.e. January 1, 1994 through December 31, 2006).
3. A final recommendation for investigating whether CTEs contributing factors resulting in an increased psychache among those who die by suicide is to conduct psychological autopsies of people who died by suicide temporally close to the aftermath of the CTEs identified in this study. These psychological autopsies should involve more than one survivor for each of the deceased and should be conducted using phenomenology as the guiding qualitative paradigm.

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APPENDIX A

LOUISIANA STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD (IRB) FOR PROTECTION OF HUMAN SUBJECTS APPROVAL LETTER

IRB #: 2950

LSU Proposal #: _____

Study exempted by
Louisiana State University
Institutional Review Board
203 8-12 DEAN Boyd Hall
225-578-8692
Robert C. Mathews, Chair

LSU INSTITUTIONAL REVIEW BOARD (IRB) for
HUMAN RESEARCH SUBJECT PROTECTION

Office: 203 8-12 DEAN Boyd Hall

APPLICATION FOR EXEMPTION FROM INSTITUTIONAL OVERSIGHT

Unless they are qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/projects using living humans as subjects, or samples or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

Instructions: Complete this form.

Exemption Applicant: If it appears that your study qualifies for exemption send:

- (A) Two copies of this completed form,
- (B) a brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts A & B),
- (C) copies of all instruments to be used. If this proposal is part of a grant proposal include a copy of the proposal and all recruitment material.
- (D) the consent form that you will use in the study to: ONE screening committee member (listed at the end of this form) in the most closely related department/discipline or to IRB office.

If exemption seems likely, submit it. If not, submit regular IRB application. Help is available from Dr. Robert Mathews, 578-8692, irb@lsu.edu or any screening committee member.

Principal Investigator Regina Trudy Praetorius Student? YES

Ph: 225-802-0147 E-mail rpraet1@lsu.edu

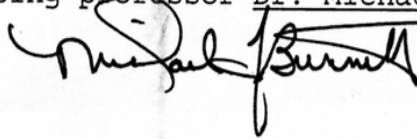
Dept/Unit: School of Human Resource Education and Workforce Development Old Forestry Bldg. Room 142

If Student, name supervising professor Dr. Michael Burnett

Ph: 225-578-5748

Mailing Address

1680 O'Neal Lane #112
Baton Rouge, LA 70816

 3/18/05

Project Title: Suicide and Community Traumatic Events: Is There
a Connection?

Agency expected to fund project None

Subject pool (e.g. Psychology Students) Coroner investigated
deaths in East Baton Rouge Parish from January 1, 1991 - December
31, 2004 and Baton Rouge Crisis Intervention Center Crisis Calls
Records from January 1, 1991-December 31, 2004

Circle any "vulnerable populations" to be used: (children <18;
the mentally impaired, pregnant women, the aged, other). Projects
with incarcerated persons cannot be exempted.

I certify my responses are accurate and complete. If the project
scope or design is later changed I will resubmit for review. I
will obtain written approval from the Authorized Representative
of all non-LSU institutions in which the study is conducted.

PI Signature Regina R. L. L. Date 3/18/05 (no per signatures)

Screening Committee Action: Exempted ☒ Not Exempted ☐ Category/Paragraph

Reviewer Michael Keenan Signature Michael Keenan Date 3-30-05

Part A: DETERMINATION OF "RESEARCH" and POTENTIAL FOR RISK

This section determines whether the project meets the Department
of Health and Human Services definition of "research" and if not,
whether it nevertheless presents more than "minimal risk" to
humans that makes IRB review prudent and necessary.

**1. Is the project a systematic investigation designed to develop
or contribute to generalizeable knowledge?**

(Note "systematic investigation" includes "research development,
testing and evaluation"; therefore some instructional development
and service programs will include a "research" component).

☒ YES

☐ NO

APPENDIX B

CONDENSATION OF SELECTED PARISH'S (COUNTY'S) CORONER "METHOD" CATEGORIES

Condensation of Selected Parish's (County's) Coroner "Method" Categories

Condensed Category	Selected Parish's (County's) Coroner "Method" Categories
Asphyxiation	Hanging Strangulation
Assault	Beating
Burns	Burns
Drowning	Drowning
Electrocution	Electrocution
Gun	Gun
Jumping/Falling	Fall Jumping
Knife	Knife
Other	Cardiac Other
Poisoning	Carbon Monoxide Drugs Poisoning
Vehicular	Auto Industrial/Mac Recreational Vehicle

APPENDIX C

CONDENSATION OF SELECTED PARISH'S (COUNTY'S) 24-HOUR CRISIS HOTLINE CALLER DATABASE "PRIMARY TYPE OF CALL" CODES

Condensation of Selected Parish's (County's) 24-Hour Crisis Hotline Caller Database
 "Primary Type of Call" Codes

Condensed Category	Caller Database "Primary Type of Call" Categories
Crisis	AIDS AIDS Information Agitation/Depression/Anxiety Alcohol Alcoholics Anonymous Battered Women Child Abuse Disoriented/Psychotic Duty to Warn Eating Disorders Employment Family Fears and Concerns-Sex Financial Gambler's Anonymous Gambling Grades/Classes Grief/Dying Holidays Homicides Homosexuality Homosexuality-Interpersonal Hurricane Incest Legal LSU Infirmary LSU Mental Health Service Loneliness/Depression Marital Medical Medication Refill/Question Narcotics Anonymous Other-Drugs Other-Interpersonal Panic Attack/Manic Episode Parent/Child Conflict-Chemical Dependency Parent/child/Other Post-Violence Follow-up without Ideation Problem Pregnancy Rape Reaction to Medication

(Table continued)

Runaways
 Self-Mutilation
 Sex Dysfunction
 Sexually Transmitted Disease
 Sibling
 Southern University Counseling Center
 Transition/Separation/Divorce
 Victim of Past Sexual Abuse
 Victim-Other
 Vietnam Veteran
 Violence-Other

Information

Academic/Factual
 Birth Control
 Community Network
 Church Information
 Community Facility/Service
 Dictionary
 Directions
 LSU Facilities/Services
 Information Request for School Report
 Phone Number/Address
 Transport/Lodging
 Traveler's Aid
 Time

Non Crisis

Caller Requested Female Counselor
 Caller Requested Male Counselor
 Caller Requested Older Counselor
 Caller Requested Specific Counselor
 Caller Requested Younger
 Counselor
 Obscene
 Other
 Other-Sex Related
 Thank you
 Voyeurism

(Table continued)

Suicide-Related	LOSS (Local Outreach to Survivors of Suicide) Team Post-Suicide Threat without Ideation Suicide Attempt Suicide-Homicide Suicide Ideation Suicide Survivors Suicide Threat Third Party Suicide
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VITA

Regina Trudy Praetorius was born in Metairie, Louisiana, on September 16, 1976, to John and Yvonne Praetorius. She received her Bachelor of Social Work in 1998 from the University of Texas at Austin. While completing her Bachelor of Arts in Spanish literature, she began her Master of Science in Social Work, which she completed in 2000. She was a Program Coordinator and Public Health Educator at Tulane University before her 3 year tenure as a Career Counselor at Louisiana State University. During this time, she received her License in Clinical Social Work from the Louisiana State Board of Social Work Examiners.

In the summer of 2002, she began her doctoral coursework at Louisiana State University in the School of Human Resource Education. She has served as a Teaching Assistant for courses in program evaluation, qualitative research, and research design. She has been an instructor for a study abroad course through Louisiana State University's School of Social Work and designed the service-learning component for the course which was selected for the Louisiana State University Center for Community Engagement, Learning & Leadership's Faculty Incentive Award. Regina has recently been nominated for the American Association of University Women's local chapter doctoral award. In January of 2006, Regina was honored to be selected as a K. Patricia Cross Future Leader in Higher Education by the American Association of Colleges and Universities. The doctoral degree will be conferred upon her in May of 2006. In August of 2006, she will begin her appointment as an Assistant Professor in the University of Texas at Arlington School of Social Work.